Frontispiece)

The Jog Falls (Gersoppa Falls) on the Sharavati.

The Gneissic structure of the rocks can be clearly seen on the face of the cliff.

(Block kindly supplied by the Superintendent, Government Printing in Mysore, Bangalore)

THE
BOMBAY KARNATAKA
A GEOGRAPHICAL SURVEY

B. S. SHESHGIRI,
B. Ag., B. Sc. (Lond.), M. Sc. (Cantab.),
LINGARAJ COLLEGE, BELGAUM.

(With 9 Plates and 22 Maps and Sketches)

1941

Rs. 2/- *(Postage Extra)*

Published by Prof. B. S. Sheshgiri,
B. Ag., *B. Sc.* (*Lond.*), *M. Sc.* (*Cantab.*),
at the Lingaraj College, Belgaum.

Printed by S. B. Haribar, Esqr., at the Tontadarya Press,
Fort, Dharwar.

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PREFACE

Future planning presupposes a sound geographical knowledge of a country. "Instruction in India takes little account of regional requirements. Pupils at school or college are encouraged to learn subjects such as history, geography, economics or philosophy from an all-India angle. This method has serious drawbacks."* A student often knows the main features of the geography of India as a whole, but he is hopelessly ignorant of the geography of his own province or area.

In recent times increasing interest is being evinced by Indians to obtain geographical knowledge of this country but, unfortunately detailed geographical surveys of the different parts of India are still few in number. In some respects it is easy to compile a small book on the geography of a large country like India. On the other hand detailed accounts of smaller areas require intensive work. Very good work has been turned out by Prof. M. B. Pithawalla, D. Sc., of Karachi, about the Lower Indus Basin. As far as I know the present work is the first in respect of presenting a geographical survey of the Bombay Karnataka. Even though a large amount of published and unpublished data has been consulted I do not claim any completeness as regards the treatment. Suggestions will always be welcome and will be thankfully acknowledged.

This work is compiled with the idea of presenting a handbook on the geography of the Bombay Karnataka to the public in general and the Kannadigas in particular. However, it can profitably be used by students who desire to study this region in great detail. It is customary to use a number of Marathi words and terms in the publications of statistical data

* The Times of India, Bombay: Leaderette, p. 6, 24-4-1941.

of agricultural crops and forest products. In the text, only Kannada words and terms have been used and the Glossary (Appendix H) should be consulted to understand their meanings. Later on I propose to publish a geographical survey of the entire Kannada-speaking area.

In preparing this book a good deal of help was sought from the Government offices and I gratefully express my indebtedness to the various officers for having gladly supplied me the necessary information with permission to publish it. I am indebted to the Director General of Observatories, Poona, for allowing the publication of some temperature figures and of extracts from his letter No. SS. 570 (50), dated 19-4-1940, and for permitting me to reproduce two maps (Figures 5 & 6) from the "Indian Meteorological Department: Scientific Notes, Vol. VII, No. 74". I am very grateful to the Superintendent, Government Printing in Mysore, Bangalore, for lending me a half-tone block of the Jog Falls which is printed as frontispiece. I am extremely thankful to Prof. A. S. Kalapesi, Ph.D.(Lond.), St. Xavier's College, Bombay, for going through the manuscript and constructively criticizing it; and to the Publication Board of the University of Bombay for suggestions. My thanks are due to Rao Bahadur S. S. Salimath, B. Ag., Deputy Director of Agriculture, Surat, Dr. S. C. Nandimath, M. A., Ph. D. (Lond.), Principal, Lingaraj College, Belgaum and Prof. S. S. Basawanal, M. A., of the Lingaraj College, Belgaum, for their help and valuable suggestions. To the Manager and Supervisor of the Tontadarya Press, Dharwar, I am grateful for promptly bringing the book to the light of the world. To Prof. G. S. Paramasivayya, M. Sc. (Cal.), of the Lingaraj College, Belgaum, who helped me a good deal in arranging the matter and going through the proofs, any

number of words is too inadequate to properly express my sincere indebtedness.

The author acknowledges his indebtedness to the University of Bombay for the substantial financial help it has granted towards the cost of the publication of this book.

Lingaraj College, Belgaum.
28th March 1941.

B. S. Sheshgiri

ADDENDA AND CORRIGENDA

P. 13. l. 18. For "Bellary districts" read "Bellary district".

P. 25. l. 1. For "The **Crystallines** and the **Gneisses**" read "The Granites, Gneisses, etc., of the Archaean age".

l. 6. For "The **Crystallines**" read "The former rocks".

P. 28. l. 8. For "some feet" read "fifty feet".

P. 28. *Karla Soils*: These soils contain large quantities of soluble salts and are very sticky when wetted. They are grouped into two classes (i) medium *Karla* and (ii) heavy *Karla*. The heavy *Karla* contains about 0·34% of soluble salts, in the top one foot layer, of which 0·14% is Sodium Sulphate which is injurious to plants as it is present in large quantity. Good soils contain about 0·1% of soluble salts of which not more than 0·03% is Sodium Sulphate. The *Karla* soils originated probably by the concentration of soluble injurious salts brought up by water from the lower layers and deposited in the top sticky layers when the water was evaporated. With small rainfall the *Karla* soils give but very poor out-turns. In years of heavy rainfall they may give a fair crop probably on account of the washing off of the salts. Addition of sand, applying large quantities of farm yard manure, organic matter, etc., are methods recommended to improve the *Karla* soils.

For "monsoons" which occurs on p. 31. l. 9; p. 33. ll. 15, 17; p. 37. ll. 7, 15, 16; and p. 38. ll. 4, 5, 18; read "monsoon".

P. 33. l. 15. For "are popularly called" read "is said to be due to".

l. 16. For "they are" read "it is".

P. 65. l. 8. For "Table VII" read "Table VIII".

P. 84. l. 6. For "**famine-effected**" read "**famine-affected**".

P. 101. l 11. For "**tenning**" read "**tanning**".

P. 121. l. 21. For "Lakshmeshwar" read "Lakshmeswar".

P. 128. l. 5 For "Bomby" read "Bombay".

P. 146. l. 14. For "aud" read "and".

P. 188. l. 4. In column 2 delete the § mark.

INTRODUCTION

THE country wherein the predominant language is Kannada is called Karnataka. It is a very ancient country having its boundaries extending far and wide as early as the ninth century A. D. The Rashtrakuta King Nripatunga (814 to 870 A. D.) describes the boundaries of Karnataka in his ' Kavirajamarga ' and points out the heart of the country wherein pure Kannada was spoken. He says that the Kannadanad (the land of the Kannadigas) extended from the river Godavari in the north to the river Kaveri (Cauvery) in the south and the land lying between Onkund of the Belgaum district, Pattadakallu of the Bijapur district, Kopananagara (Koppal) of the Nizam's Dominions and Lakshmeswar found within the boundary of the present Dharwar district was the heart of Karnataka with the purest spoken language. Kannada is accepted to be a branch of the Dravidian group of languages. Dravidians were the inhabitants of India before the Aryans came here. In course of time, it is believed, the Aryans and the Dravidians mixed freely and became one nation. The present religions, cultures and languages contain the best that was in the two peoples. It is, therefore, quite possible to find evidences of the Dravidian culture

over the greater part of India. However, in dealing with the present day conditions, it is desirable to take into consideration only the conditions of the present time and those of a few hundred years ago.

In order to determine the boundaries of the present-day Karnataka one should take into account the percentage of the peoples speaking the Kannada language. The districts in which there are more than fifty percent of the people who speak Kannada as their mother tongue, or the districts in which the Kannada-speaking people form the largest single group can rightly be included in Karnataka. It is generally accepted that the present provincial boundaries of India are mere historical accidents and that India should be divided into provinces based on languages and it is, therefore, not wrong for the Kannadigas to attempt to have a province of their own.

There are other reasons for the necessity of having a unified Karnataka. Firstly, the present area of Karnataka is considerably less than what it was about three hundred years ago because a considerable portion of it has been alienated and included in the neighbouring areas such as the Maharashtra, Andhra and the Tamil parts. Secondly, the other languages viz., Tamil and Malayalam in the south

and the southwest, Tamil and Telugu in the east and Marathi in the north have been steadily forcing their influence on the Kannada people. Thirdly, the area, at present inhabited by the Kannada people, is divided between the Bombay and the Madras Presidencies, the Mysore State, the Nizam's Dominions and a number of small states. Kannadigas, under these circumstances, can have no scope for a uniform development in cultural, economic and social spheres. Moreover, except in the Mysore State, the Kannada districts are situated near the borders of the provinces and the Kannadigas are in the minority having very little political influence in the respective governments.

Table I gives the areas and populations of the different divisions of the Karnataka.

TABLE I

Table giving the areas and populations of the different divisions of the Karnataka.

Name of the Division.	Area in Sq. Miles.	Total population in 1931.
Bombay Karnataka. (Districts of Belgaum, Bijapur, Dharwar and North Kanara only). ...	18,874	34,66,433 [1]
Madras Karnataka. (Districts of Bellary, Nilgiri, S. Kanara, and the talukas of Madagasira, Hosur, Krishnagiri and Kollegal). ...	15,701	32,86,824
Coorg. ...	1,593	1,63,327
Mysore State. ...	29,326	65,57,302
Nizam Karnataka. (Districts of Raichur and Gulbarga and parts of Bidar and Osmanabad). ...		16,20,094 [2]
Karnataka in Southern Maratha States and the Madras State Agencies except Cochin and Travancore. ...		6,11,967 [2]

The Southern Maratha States of Akalkot, Jamkhandi, Mudhol, Ramdurg and Savanur, the Madras State of Sandur and the talukas of Shirahatti (Sangli State), Lakshmeswar (Miraj Senior) and Gudgeri (Miraj Junior) have almost entirely

1 Greater part of the Sholapur taluka and adjoining area and a few villages of the Satara district are also claimed as Kannada speaking territories by the Karnataka Unification Movement.

2 Kannada speaking people only.

Kannada speaking people while in some parts of the States of Aundh, Kurandvad Senior and Junior, Kolhapur, Jath and Miraj Senior and Junior, the predominant language is Kannada. It is possible that some difficulties may arise if the Karnataka parts of the States are included in the future United Karnataka but there appears to be no difficulty in combining the Karnataka districts of the Bombay and the Madras Provinces as a first step towards the Unification of Karnataka.[1] If this is done the area will be more than 35,000 square miles and the population more than 70,00,000. Such a Province will be comparable in either extent or population or both to provinces or countries such as Nepal, Denmark, Ireland, Belgium, etc., and also is said to become financially self supporting.[2] There is thus every justification for a United Karnataka.

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1 The Karnataka parts that belong to the States should be attached to the future Province of Karnataka if the treaty relations between those States and the Government of India allow such an arrangement.

2

Country.	Area in Sq. Miles.	Population.
Nepal.	55,000	56,00,000
Denmark.	32,592	42,28,553
Ireland.	16,576	35,50,656
Belgium.	11,752	80,92,004
Austria.	32,369	65,34,481
Bulgaria.	39,814	54,78,741
Greece.	50,257	62,04,684
Hungary.	35,875	86,88,349

In general Karnataka is a verdant country with winding streams, beautiful hills and mountains and large stretches of cultivated land growing dry and irrigated crops. In the west there are large areas of forests either evergreen or monsoon; in the east the land is plateau-like and is rather uninteresting but the soil, being fertile, gives heavy yields of crops like cotton, oilseeds, etc.

Such a beautiful country cannot be expected to have an uneventful history. Karnataka possesses traditions of having been the place of action of Parasurama; Rama, the epic hero, is believed to have traversed this country and so also the heroes of Mahabharata. In the historic times, the Kadamba, Ganga, Badami Chalukya, Rashtrakuta, Kalyana Chalukya, Kalachurya, Hoysala and Yadava dynasties established their supremacy in Karnataka up to the fourteenth century A. D. In the second quarter of the fourteenth century the Kingdom of Vijayanagara, one of the greatest kingdoms of mediaeval India, came into existence and continued to thrive until it was defeated by the confedaracy of the Mohammedan Kingdoms of Deccan. Then the Muslim States of Deccan became p edominant and ruled for a century or so. They were followed by the Moguls, the Mysore Sultans and the Marathas. The last to come were the British and then Karnataka was partitioned

and distributed amongst more than twenty large and small administrations.

The achievements of the Kannadigas, in the spheres of language, religion, philosophy and culture are by no means small. The archaeological excavations, architecture, sculpture, painting and music testify to this statement. Karnataka has become practically the home of Shaivism, Vaishnavism and Jainism. Kannada literature is very old and vast. It boasts of eminent poets like Pampa, Ponna, Ranna, Harihara, Raghavanka, Shadakshari, Kumara Vyasa, Lakshmisha, etc., who equal in eminence the famous poets of ancient and modern literatures.

The present-day Karnataka has not progressed as much as it was expected of it owing to many reasons out of which the following are the most important. Firstly, the Kannadigas did not take seriously to the English education in the early periods of the British rule. They, therefore, lagged behind the others in administrative, commercial and other matters. Secondly, after the development of the Bombay harbour the trade of Karnataka has been diverted to Bombay and the small harbours on the coast of Karnataka have become practically useless. Most of the Karnataka harbours are shallow or exposed and are unsuitable for the entry of large

steamers. Therefore the advantages, the Kannada people were deriving out of the trade, have been lost to them. Thirdly, parts of Karnataka are famine stricken on account of the paucity and irregularity of rainfall even though the soils are fairly fertile. A well planned irrigation scheme would have improved the agriculture of these areas. Finally, disunity, communal feelings, mercenary inclinations, lack of the spirit of public service and bringing in of non-Kannada officers have a large say in the matter.

KARNATAKA, A GEOGRAPHICAL UNIT FOR STUDY.

Some people define a geographical unit as an area which has almost uniform natural conditions—uniformity in physical features, climate, vegetation, soil, etc., and consequent utilisation and development. These conditions do not surely obtain in the area which we have included in Karnataka. Physical features, which are mostly due to the geological and tectonic history of the area modified by the age-long action of the denuding agents, are not uniform; there is a vast difference between the western coastal plain with its transverse hills and creeks and the towering mountains of the Western Ghats, and again between the Ghats and the eastern plateau. Climatically

there is a world of difference between the temperatures and rainfalls in the western parts and the eastern parts. There is a good deal of variation in the types of soil: the black soils of the Belgaum district are quite different from the red soils of the southern parts and the latter from the sandy soils near the coast and the Bellary district. Consequently vegetation also varies. The evergreen forests of the coastal area and the Ghats give place to the monsoon forests and the latter in turn are superseded by the parklands, scrub forests and grass lands towards the east. Cultivated crops also differ. In the west rice is the chief crop; in the central area both rice and crops requiring less moisture are grown; while in the east crops requiring very small amount of moisture become important. Thus Karnataka is not a uniform natural unit for study.

Other people attach more importance to the human factor and say that an area physically diversified can be made an economic unit by co-ordinating the various parts for the benefit of each other and the whole. In fact such a co-ordination is held to be essential in a geographical unit. This state of affairs does not exist at the present moment in Karnataka. The only common factors are the uniformity in the language on broad lines and a

common cultural heritage. These are very strong factors in favour of unification. A geographical unit should have something more than these. A geographical unit should have variety; but the variety, either natural or artificial or both, should be used with the help of a net-work of efficient means of communications, by some central agency following a consistent and beneficial policy towards all the component parts. The central agency may be a government consisting of the representatives of the components. Such a government, helped by a large variety of conditions and productions—mineral, agricultural, forest and industrial—and further helped by uniformity of language and culture, probably constitutes an ideal body to control and develop a geographical unit and to disseminate all forms of knowledge, ideas and ideals to the included parts. This is a strong and understandable argument in favour of the unification of Karnataka. Today Karnataka is neither naturally nor politically a unit.

PREPARATION OF MAPS.

A word of explanation regarding the preparation of the distribution maps, found in the following pages, is necessary. Of the various ways of pictorial representation of statistical data the dot-distribution-map

is one of the best and the most accurate. In the preparation of these maps some fundamental considerations are taken into account. The unit dot is made of such a size as to give the best result in the end; and the dots are placed in their appropriate places and not distributed evenly over the entire area. Taluka statistics are available. In a taluka a crop, for instance, may not be distributed all over the area but may be confined to certain parts only. In such cases dots are not placed on those parts of the map referring to the areas where the crop is not grown. For example, in the case of a distribution map of the *Jola* (great millet) crop dots are not found in those parts of the map which represent the "impossible" areas such as sites of settlements, roads, railways, canals, rivers, ponds (tanks), reservoirs, higher parts of hills, steep slopes, rock exposures, rocks covered with very thin layer of soil, forest land, areas getting more than about 50 inches of rainfall, etc. These maps, therefore, give as faithful a representation of the crops as possible.

CHAPTER I

Position and Area

IN the following pages an attempt has been made to present the geography of the four Kannada districts of the Bombay Presidency, viz., Belgaum, Bijapur, Dharwar and North Kanara (Bombay Karnataka). The study of geography includes, among other things, the study of the physical features, climatic conditions, natural and artificial vegetation, agricultural and other industries, distributions and occupations of the people and the means of communications: in other words it means the study of man in relation to his natural and artificial surroundings. To make an intelligent study of these factors detailed statistics are quite essential. In the British districts of the Bombay Karnataka the required statistical data can be obtained, but the same thing cannot be said of the portions of the Indian States included in and adjacent to the Bombay Karnataka. For the present, therefore, the State areas have been left out of consideration except for an occasional reference here and there.

The Bombay Karnataka lies between 13°53′ and 17°29′ north latitude, and 74°2′ and 76°32′ east longitude and has an area of 18,874 square miles made up as in Table II.

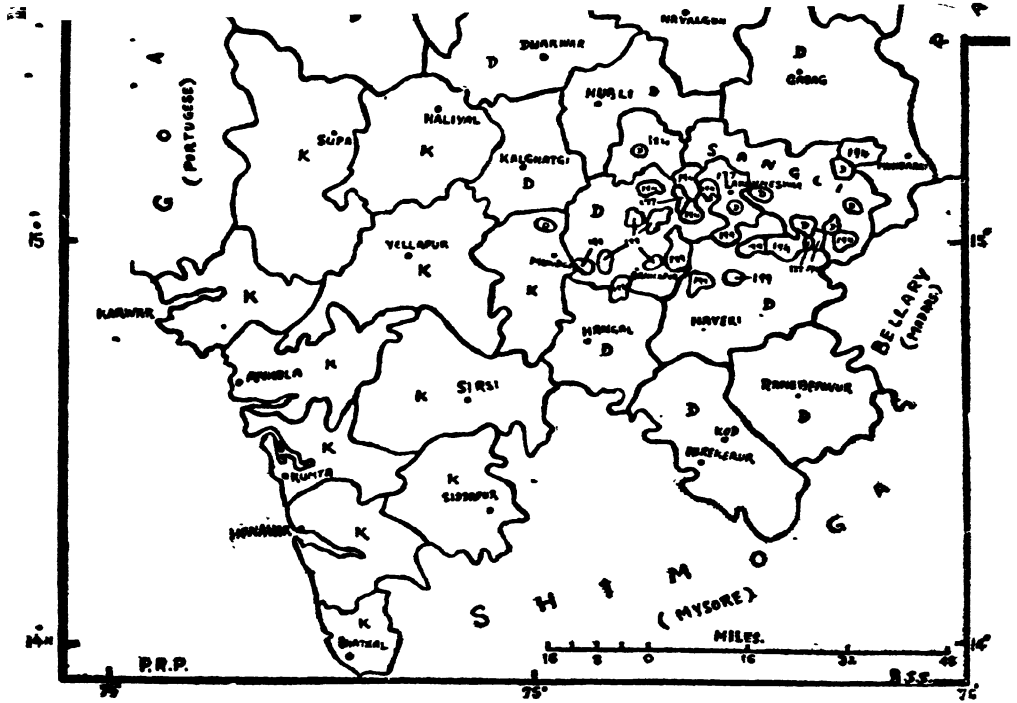


Fig. 1.
The Political Map of the Bombay Karnataka.

TABLE II

Areas of the different districts in the Bombay Karnataka.

District.	Area in sq. miles.
Belgaum.	4, 612
Bijapur.	5, 710
Dharwar.	4, 606
North Kanara.	3, 946
Total.	18, 874

It extends for nearly 220 miles in the north-south direction and 150 miles in the east-west direction. It is bounded by the territories of the Kolhapur and the Savantwadi States, the Portugese territory of Goa and the Arabian Sea on the west, the States of Miraj Senior, Miraj Junior, Jath and Sangli and the district of Sholapur on the north, Akalkot State, the districts of Gulbarga and Raichur of the Nizam's Dominions and the Bellary districts of the Madras Presidency on the east, and the Shimoga district of the Mysore State and the South Kanara district of the Madras Presidency on the south. A glance at the political map (Fig. 1) at once shows that the lands of the Bombay Karnataka, especially the Belgaum and the Dharwar districts, are greatly mixed up with those of the neighbouring Indian States.

CHAPTER II

Physical Features

THE physical diversity of the whole of the Kannada-speaking territory has already been touched. The Bombay Karnataka also is not physically uniform and the following three broad divisions are possible (Fig. 2).

(a) *The Coastal Area*:- Along the west coast running for nearly 80 miles there is a narrow **coastal plain** of about 8 to 20 miles in width and about 250 feet above the mean sea level. The plain is divided into small portions by the creeks of the rivers flowing towards the west, the small bare laterite hills and the high forested spurs from the Western Ghats; further east the plain breaks up into thickly forested uplands separated by narrow, gorge-like, tortuous valleys (Plate I. a.). The valleys are formed by the seasonal, torrential streams flowing from the Western Ghats. Four of these streams are of some importance, viz., the Kalinadi in the north, the Gangavali and the Tadri (Aghanashini) in the middle and the Sharavati in the south. Cultivated areas and settlements are found near the coasts, on the plains and near the large and small streams. The streams have ungraded valleys with a number of **waterfalls** and **rapids**. The Sharavati plunges over a cliff, 830 feet

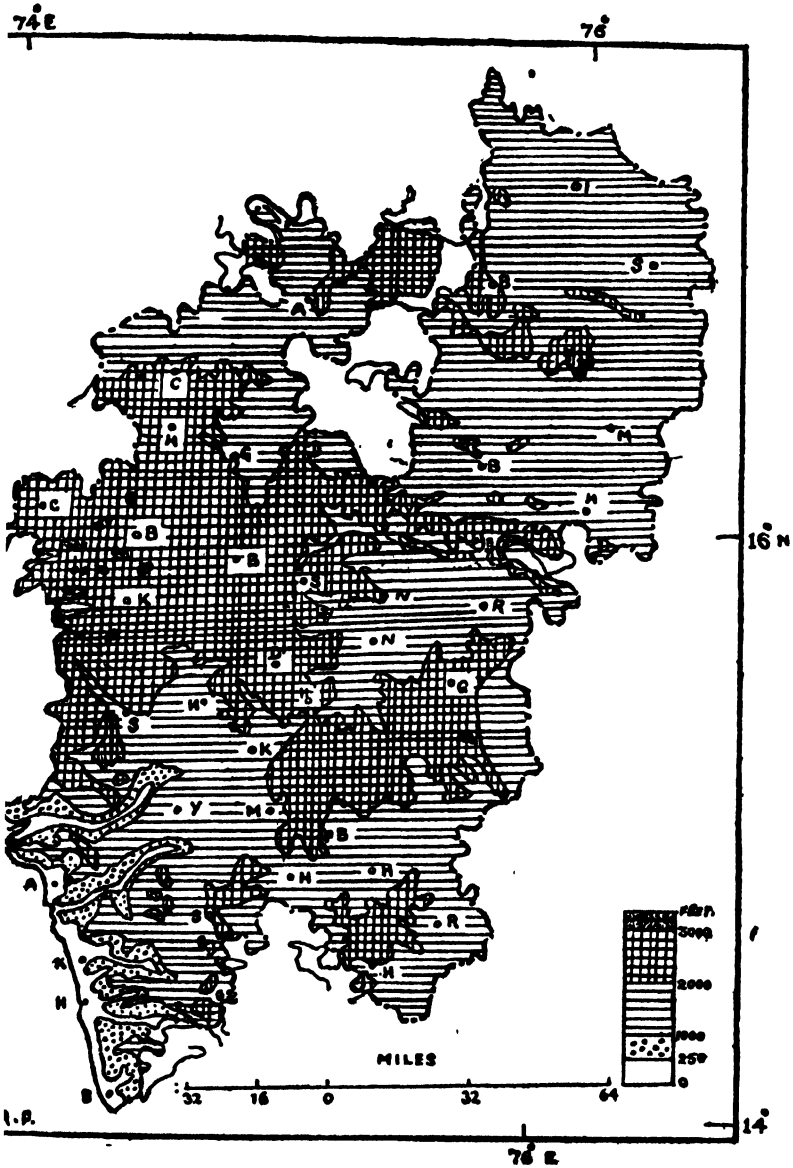
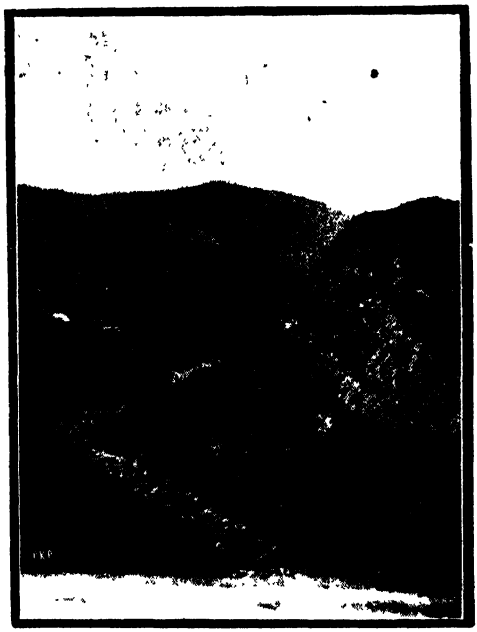


Fig. 2.
The Physical map of the Bombay Karnataka.

in hieght, and forms the well known Jog Falls (Gersoppa Falls). The river divides into four cascades, the Raja, the Roarer, the Rocket and the Dame Blanche (White Lady)- only the Raja falls the whole depth without touching the rocks (Frontispiece). The Unchhala or the Lushington Falls on the Tadri is 400 feet deep. Amongst the others worth mentioning ones are the Lalguli Rapids on the Kalinadi (about 300 feet) and the Magod Rapids on the Bedti tributary of the Gangavali. Near the mouths there are wide stretches of water called **creeks** and the harbours are situated on these creeks or the other parts of the coast. The coast itself is broken and there are small bays like the Karwar Bay and the Belekere Bay, and islands like the Kurmaguda Island, Devgad Island, Anjidiv Island and the Basavarajdurg Island (Fig. 17 and Plate IV. a). The coastal area is believed to be a portion of the plain of marine denudation exposed due to the slight but appreciable elevation of the peninsula.*

(b) ***The Ghats and the Western Parts of the Plateau:***— The **Ghats** are between 1,500 feet and 2,500 feet above sea level in the south and 2,000 to 3,000 feet above sea level in the Belgaum district. A few peaks, usually built of the Deccan Traps, are flat topped and go over 3,000 feet. The horizontally

* Wadia D. N. : Geology of India. 1939 p. 32.



Inter-locking Spurs in the deep and ungraded Gorge of the Sharavati between the Jog Falls and Gersoppa.

PLATE I. b.

The Western Ghats (near Devimane) as seen from a

bedded lavas in the north have, on weathering, given the characteristic "landing stair" aspect which is very well seen in the ranges west of Belgaum. In the south some peaks, like the Darshini Gudda in the Supa Peta, go over 3,000 feet. The Ghats present a steep escarpment over 1,000 feet high (Plate I.b.). Devimane Ghat and Arbail Ghat are well known examples. The Ghats slope eastwards and form the higher western parts of the Plateau, the boundary of which may be taken to stretch from Hangal to Nipani through Haliyal, Khanapur, Belgaum and Sankeswar. This area gets a high amount of rainfall and feeds the rivers flowing towards the west and the east. Large areas are forested. The High Plateau sends out four main spurs to the east. One spur stretches from the Amboli Ghat and passes between the Haranakashi and the Ghataprabha rivers. The Mahipatgarh Ridge northwest of Belgaum and the Bailur Ridge southwest of Belgaum are broken in many places. Yellurgarh is situated on the extension of the Bailur Ridge. The Jamboti spur, south of the headwaters of the Malaprabha, is the southern-most mountain formed by the Deccan Traps. One peculiarity about the High Plateau is that it is studded with deep, steep-sided and abruptly starting **Valleys** on the Plateau surface. The valleys have forests at their heads followed by betelnut gardens and rice fields (Plate III. a.). **Caves**

containing stalactites and stalagmites are common in areas having a great thickness of limestone as, for instance, near Ulvi in the Supa Peta. The whole of N. Kanara except the coastal area and the area west of a line approximately passing through Belgaum, Dharwar and Hirekerur in the Belgaum and Dharwar districts may be included in this division.

(c) *The Eastern Part of the Plateau:*— This part has an altitude of 1,000 to 2,000 feet above the sea level with a few stretches over 2,000 feet. In the Belgaum district the Plateau is dissected by rivers and has two low ranges—one between the Malaprabha and the Ghataprabha rivers and the other between the Ghataprabha and the Krishna rivers—which pass eastwards into the Bijapur district. There are in addition solitary peaks as, for instance, the Kathariga d near Murgod and the Parasgad and the Yallammanagudd near Saundatti. In the Bijapur district three divisions can be made. The northern belt is an area of billowy uplands; there are many rounded hills and cultivation is restricted to the valley bottoms. The central belt consists of the rich alluvial plains of the Don and the Krishna except for the Hungund Hill formed by Haematite schists. In the south the area is made up of two ranges stretching from west to east over the entire district. The ranges are the continuations of those in the Belgaum district and may be called the Bagalkot and the Badami Ranges. The

Bagalkot Range branches near Bilgi and the southern branch crosses the Ghataprabha and joins the **Badami Range** near the eastern part of the taluka. This connecting Range is called the Sitadongar. Similarly a branch is sent off from the Badami Range near 75°25′ E. and trends towards east of south-east and beyond the Malaprabha, stretches away in a line of discontinuous hills terminating abruptly a few miles east of Gajendragad. There is a number of small ranges between the Badami and the Bagalkot Ranges. The Malaprabha is very fond of crossing and recrossing the southern range. There is a crossing about 8 miles north-west of Saundatti at a place called Navilatirth, another near Torgal, a third a few miles east of Ramdurg, a fourth east of Badami near Shivayogamandir and a fifth to the west of Kerur. In the Dharwar district the Plateau is crossed by five ranges. The **Buddana Range** between Hubli and Kalghatgi runs north—south and is not more than 500 feet above the Plateau surface. The **Airani Range** in the south-east is only ten miles long and its highest point is about 700 feet over the surface. The most marked are the **Kappat Ranges.** They start just south of Gadag and continue south-east for nearly 30 miles up to the Tungabhadra river. Their peaks are more than 1,000 feet over the Plateau surface. These Ranges are bare for the most part and have a number of derelict gold

and iron mines. In the south there are two ranges both of which are crossed by the Kumudvati river. Near the southern crossing a natural lake, Madag Lake, is formed and its waters are led by two canals to irrigate a few acres of rice and sugarcane in the Kod taluka. The southern range forms the boundary between the Bombay Karnataka and the Mysore state. On the whole there are large stretches of plain lands on the Eastern Plateau. This division lies east of a line passing approximately through Belgaum, Dharwar and Hirekerur and includes the eastern parts of the Belgaum and Dharwar districts and the entire Bijapur district.

The Ghats and the Plateau regions are traversed by rivers which have their head streams almost within sight of the west coast. This looks anomalous in a land of great antiquity where the drainage has existed for a long time. Some hypotheses have been put forward to account for this state. One supposition regards that the present water parting of the Western Ghats was in the middle of the peninsula and that the western half of the peninsula has, after a fracture just west of the Ghats, sunk under the Arabian Sea. Another idea is that the peninsular block south of the Tapti crack has been tilted eastwards at the time of the Late Tertiary Orogenesis.* The largest and the most important streams are the Bhima, the Krishna, the Ghataprabha, the

* Wadia D. N. : Geology of India. 1939. pp. 18-19.

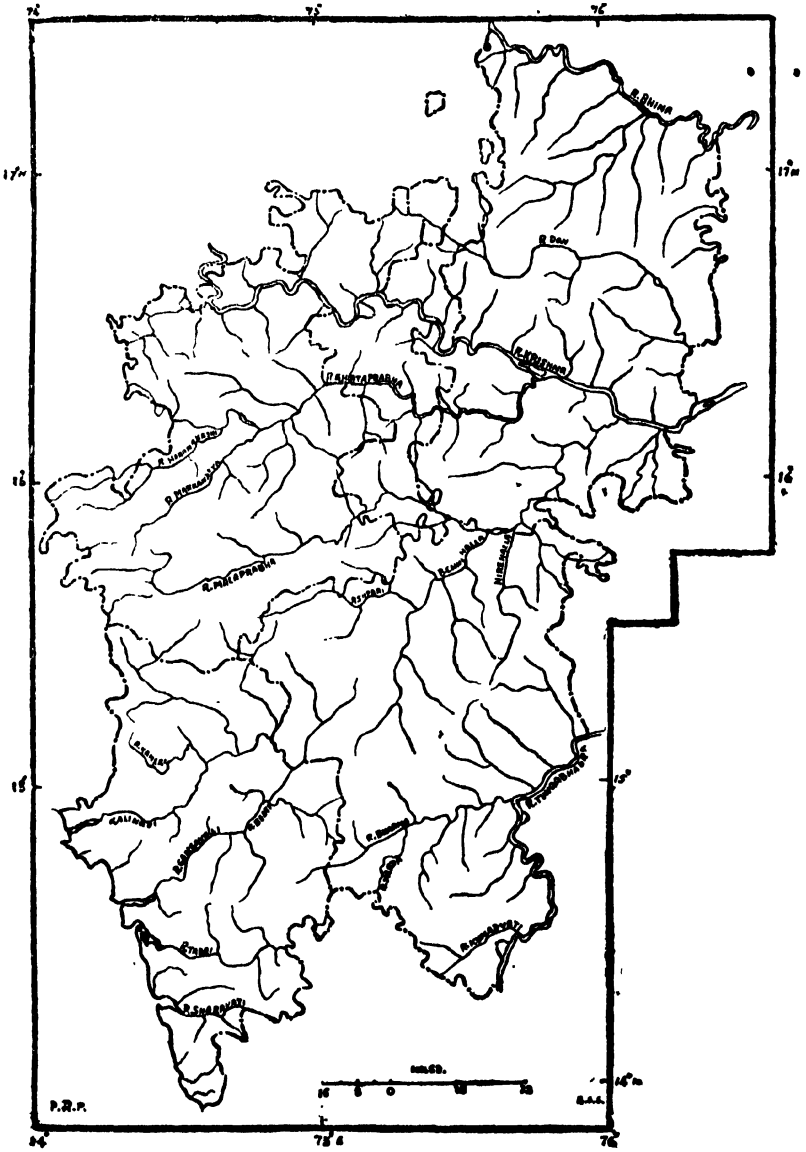


Fig. 3.
The Drainage Map of the Bombay Karnataka.

Malaprabha,the Varda and the Tungabhadra (Fig. 3). They have large tributaries like the Haranakashi and the Markandeya of the Ghataprabha,Benni Halla and Hire Halla of the Malaprabha,the Dharma of theVarda and the Kumudvati of the Tungabhadra.None of these streams can be utilised for navigation because they have ungraded valleys in this area and long stretches of calm and permanent water are not obtained. And only the Ghataprabha, the Dharma and the Kumudvati are used for canal irrigation on a large scale. All the streams are seasonal and even the mighty Krishna is a mere trickle in the dry season. Some of these streams, especially those that flow towards the west, have small and large waterfalls and rapids, many of which may be harnessed for the production of electric power (Plate II. a.). Electric power is generated at the Gokak Hydro-Electric Power Station, utilising the falls on the Ghataprabha (about 170 feet). The Mysore Government are building a dam across the Sharavati in order to store and regulate the supply of water for generating electric power at the Jog Falls. A certain amount of water will always be coming via the natural falls and the natural beauty,therefore,will be preserved. The report on the Hydro-electric Survey of India mentions that the following sites are worth further investigation:* (1) site on the Kalinandi near

* Report of the Bombay Economic and Industrial Survey Committee 1938-1940, Bombay. p. 16.

Kheda village in the Supa Peta, (2) site on the Bedti river near Magod in the Yellapur taluka, (3) site on the Bene *Nala* on the Sirsi-Kumta road, (4) site on the Kaneri river about 10 miles from Kumbharwada in the N. Kanara district, (5) site on the Hiraryakshi river about 38 miles from Belgaum and (6) site on the Mahadeo river 17 miles from Khanapur.

GEOLOGY AND SOILS.

Geologically most of the rocks of the peninsular part of India are very old. There was enough time for the agents of denudation to have their full play. The physical features, therefore, do not adequately reveal the geological nature of the country. The Deccan Lavas usually, but not always, form the higher ground in the Belgaum district but all the higher areas are not necessarily made of the Deccan Lavas; the Granites and the Gneisses of south Karnataka also form the Ghats though they are silghtly lower. The same generalisation applies to the eastern part of the Bombay Karnataka

The simplified geological map (Fig. 4) shows that there are six groups of exposed rocks in the Bombay Karnataka and amongst these the crystalline Granites, Gneisses and the Dharwar Series included in the Peninsular Archaeans mainly of metamorphic origin and the Deccan Traps together cover more than 85% of the

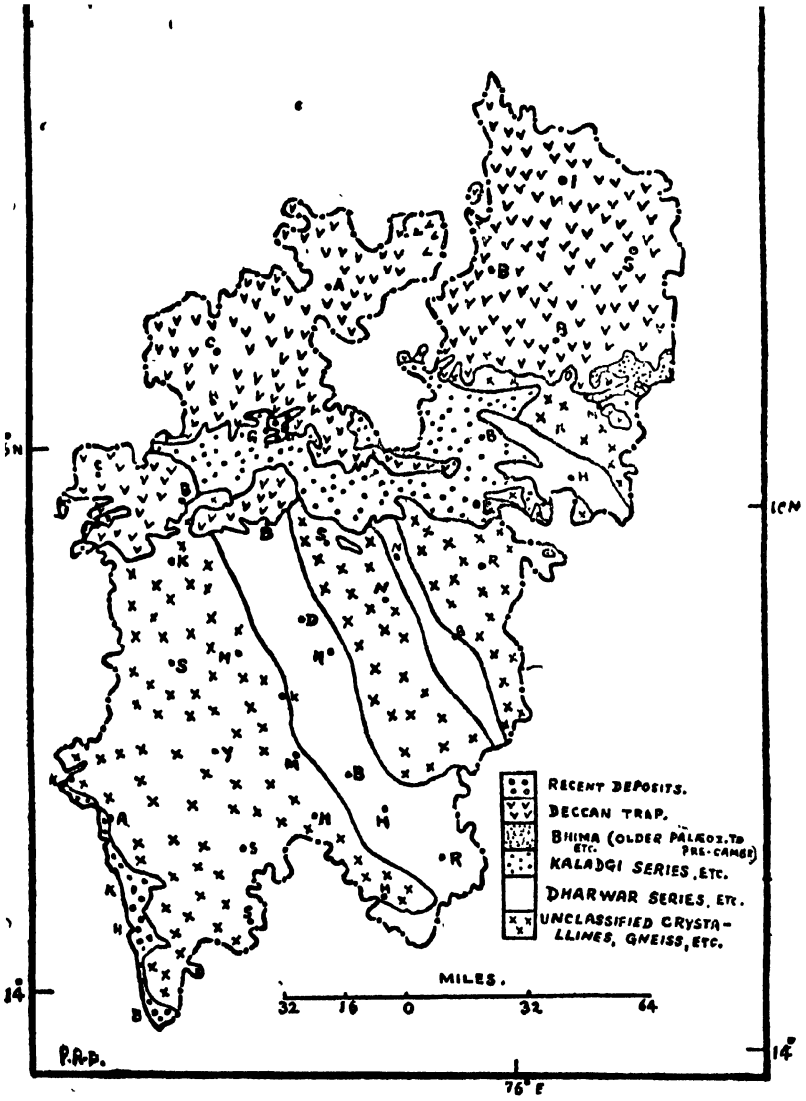


Fig. 4.
The Geological Map of the Bombay Karnataka.

'Unclassified Crystallines, Gneisses, etc. = Granites, Gneisses, etc. of Archaean Age.

area. The **Crystallines** and the **Gneisses** are the oldest rocks and cover the whole of the Dharwar and the N. Kanara districts and the southern parts of the Belgaum and the Bijapur districts, except for the north-south bands of the next group of rocks namely, the Dharwar Series. The Crystallines consist of Granitoid Gneisses, sometimes highly porphyritic; of hornblendic, micaceous, chloritic, haematite and talcose schists; and of a few crystalline limestones. They are traversed by intrusive rocks in many places. The **Dharwar Series** are highly metamorphosed shales, slates, schists, phyllites and quartzites, and are often highly metalliferous containing ores of iron, manganese, copper, lead, gold, etc. They are preserved in synclinoriums striking north-south. The next group is that of the **Kaladgi Series** belonging to the Cuddapah System. They are several thousands of feet thick and are made up of quartzites, limestones, shale, slates, conglomerates and breccias. They occupy an area between Belgaum and Kaladgi. Towards the west they disappear under the Deccan Traps. Their upper part includes some haematite schists with such a concentration of haematite as to be profitable to use them for the extraction of iron. The **Bhima Series** belonging to the lower part of the next system — the Vindhyan System — are composed of quartzites and grits in the lower part and shales and limestones in the upper part. The next group is the well known

Deccan Trap, exposed over the entire northern part of the Bombay Karnataka. The word " Trap " is used here to mean " stairs " or " steps ", an allusion to the step-like aspect of the weathered Lavas on the sides of the Deccan ranges. The rocks consist largely of fissure-errupted horizontal basaltic lava flows, each flow being from 10 to over 50 feet in thickness. The percentage of acidic rocks, ash, tuff, etc., is very small. In the western part the total thickness is over 2,000 feet. The sedimentary Inter-Trappean Beds, with a large number of fossils, animal and vegetable, show that there were long intervals of quiescence between the major out-pourings of the lavas when there was sufficient time for the denudation of the lavas and the deposition of the weathered materials. The age of the Deccan Traps is summarised by Mr. D. N. Wadia of the Geological Survey of India thus: " from external evidence it is quite apparent that the Deccan Traps cannot be older than the Danian Stage of the Upper Cretaceous, while from the internal evidence of fossil fishes, palms, foraminifers, etc., they could not be much younger than the Eocene ". * The last group is of the **Recent Deposits** which cover the coastal plain and very small areas east of Gokak.

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* Wadia D. N.: Geology of India. 1939. pp. 220-221.

The soils of the Bombay Karnataka may be broadly divided into two groups viz., (1) the **Residual Soils,** which are the altered residues of the underlying rocks, after some of the soluble constituents have been removed, mixed with a little decomposed organic matter; and (2) the **Drift Soils,** which are the alluvial debris of rocks brought by streams from some higher place and deposited in the stream-bed and near the stream-mouth. In these may be included the soils found on the uplifted continental shelf which forms the coastal plain.

Most of the soils of the Bombay Karnataka and especially the residual soils have attained full maturity, meaning thereby that they have been exposed to the action of the atmospheric agents for a sufficiently long time to allow the pedogenic processes to have full operation. Therefore, one finds that the soils which seemingly look alike as, for instance, the black soils of the Dharwar and the Belgaum districts are formed from entirely different rocks.

The **black soils** or the " **Regur** " are found in the northern parts of the Belgaum and the Bijapur districts where they are formed by the disintegration of the Traps and further mixed with a little sand and decomposed organic matter, and in the eastern part of the Dharwar district where they are formed from

the Archaean Rocks. They are highly argillaceous, fine grained soils containing large proportions of iron oxide, calcium and magnesium carbonates; the calcium carbonate occurs as lime concretions called "*Kankar*". They are sticky when wet, retain moisture for a long time and have an extraordinary degree of fertility. Their thickness varies from a few inches to more than some feet and where shallow, as in the billowy uplands of the northern part of the Bijapur district, they are not very productive. Some portions of the black soils contain large amount of salts and are called *Karla soils.* There are practically no crops over the *Karla* patches, but if the rainfall is more and well distributed the *Karla* land may produce a moderate crop. *Kariki* or *hariyali*, a deep-rooted pernicious weed, has proved a menace of great magnitude to the development of the black soils. This grass has been responsible for rendering 10 to 15 per cent of fertile cotton soil into a barren waste. Ploughing by heavy tractors or hand-digging have been recommended by the Agricultural Department.

The **red soils** are derived from various rocks like the Granites, Gneisses, Dharwar Rocks and rocks of the Kaladgi and the Bhima Series. In these soils may be included the laterite soils, the iron clay soils, the sandy soils and the soils derived from shales,

schists and limestones. The laterites are found mainly on the coastal hills, on the Western Ghats and the western part of the Plateau where rainfall is very high. Except the limy soils most of the red soils are naturally poor; but the large amount of rainfall in the west and the continuous addition of manure and decomposed matter from the Traps have made them comparatively rich in some parts. The red soils near Belgaum are very rich.

The **sandy soils**, especially in the Gokak, Saundatti, Kaladgi and Badami areas yield poor crops. They are poor, porous and do not retain moisture for a long time.

Considerable areas are covered with **alluvial soils.** They are found all over the Bombay Karnataka and especially on the low-lying grounds on the western part of the Plateau, in the Don and the Krishna valleys of the Bijapur district and in the stream basins and the coastal areas of the N. Kanara district. They are on the whole rich soils. In the deep valleys of the southern part of the Above-Ghat area of N. Kanara district there are **garden soils** which are every now and then replenished by the addition of soil from cuttings on the sides of the valleys (***Kagdali***). They are enriched by such additions and by heavy doses of leaf manure. Just

near the coast there are large covers of **drift sand** on which cocoanut plantations are usually seen (Plate IV. b.). Behind the coast and near the creeks there are some **salt marshes** with very poor soils. These grow salt-land rice or "*Kagga Bhatta*", the yield of which is very poor.

CHAPTER III

Climate and Vegetation

Climate

THE dominant features of the climate of the Bombay Karnataka are mainly two: firstly, the altitude of the plateau reduces the temperature to an appreciable extent making the climate very pleasant and secondly, except in the north-eastern part, maximum amount of rain falls at the time of the S. W. monsoons.

The coastal areas have oceanic influence and the temperatures are equable, but the constant high humidity makes the summers enervating. Karwar has an average maximum temperature of 89·7° F. occuring in May, an average minimum temperature of 65·8° F. occuring in January and an average annual relative humidity of 83%.* The absolute values of the maximum and the minimum temperatures in Karwar are 98° F. and 53° F. In the western hilly parts of the Belgaum district, most of the N. Kanara district and the Malnad (western) part of the Dharwar district the average winter temperature is between 50° F. and 55° F. and the minimum goes down to 40° F. sometimes. On the whole the climate is not healthy. That the valleys of N. Kanara are fever-ridden,

* Memoirs of the Indian Meteorological Department : Vol. XXII. Part III. Calcutta 1914.

especially in the first two months of the rainy season and the three to four months of the cold season, is a well known fact; the same is the case in the Chandgad Peta and the Khanapur taluka of the Belgaum district. Early morning mists are quite common in the months of December, January and February. In summer the temperature is near 100° F. in the day-time but the nights are cool even in May on account of the altitude. The most pleasant climate is found in a belt of country, parallel to the Ghats, in the Belgaum and the Dharwar districts. The moderate heat and the early and fresh breezes make this belt very healthy. The average maximum temperature in Belgaum occurs during April and is 95·7° F.; the average minimum of 57·6° F. is in January; and the average annual relative humidity is 70%.* The absolute values of the maximum and the minimum temperatures in Belgaum are 108° F. and 44° F. respectively. The *Desha* tract which covers the eastern parts of the Belgaum and Dharwar districts and most of the Bijapur district is dry and healthy except in the bushy parts of the Badami taluka. In winter the temperature is about 60° F. Frosts are very rare or unknown. The summer heat on the other hand is very trying: the absence of

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* Memoirs of the Indian Meteorological Department: Vol. XXII. Part III. Culcutta 1914.

trees adds to the summer heat. Records of 110° F. are not quite uncommon. The maximum temperature occurs in the month of May in Bijapur and the average maximum over a number of years is 101·3°F. The average minimum temperature which occurs in December is 57·3° F. * The absolute maximum and minimum temperatures in Bijapur are 110° F. and 44° F. respectively. Available statistics of the average monthly maximum and minimum temperatures are given in Appendix A.

PRECIPITATION.

The precipitation occurs mostly at the time of the S. W. monsoon, but in the eastern parts an appreciable amount occurs in the last months of the year. The latter are popularly called the N. E. monsoons but they are actually due to the disturbances caused at the time of the retreat of the S. W. monsoons. The explanation is as follows: " The south-west monsoon usually retreats southward from the Bombay Province in the second week of October. During its withdrawal and for some days afterwards thunderstorms occur fairly frequently in the Bombay Deccan in the second fortnight of October. The retreat of

* Memoirs of the Indian Meteorological Department: Vol. XXII. Part III. Calcutta 1914.

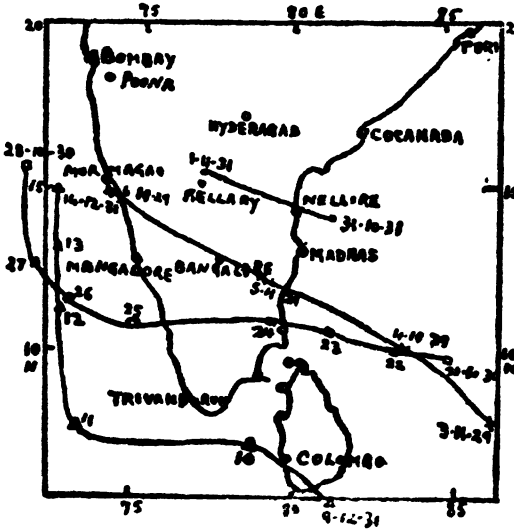

Fig 5.
Tracks of some Storms in November 1929, October 1930, October-November 1931, and December 1931.

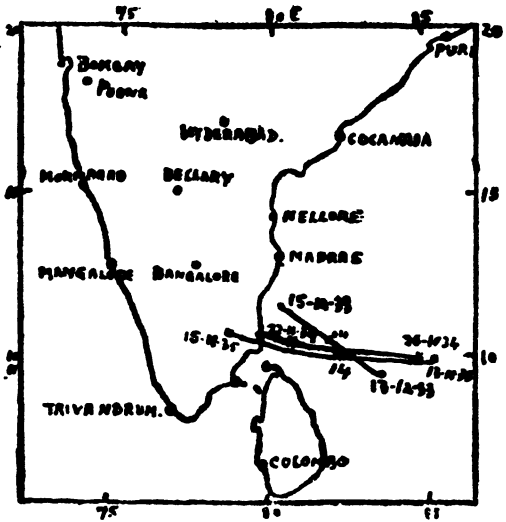

Fig. 6.
Tracks of some Storms in December 1933, November 1934, and November 1935.

(Reproduced by the courtesy of the India Meteorological Department.)

the south-west monsoon in the Bay of Bengal which takes place simultaneouly is generally accompanied by the formation of a low pressure area in the centre of the Bay. By the beginning of November, this area moves to the south of the Bay and the so-called 'north-east' monsoon sets in on the east Madras coast. It should be noted however that this is also the retreating southwest monsoon which has a cyclonic circulation round the low pressure in the south of the Bay. The moisture bearing winds arrive from a northeasterly direction on the Madras coast. The strength of these winds is augmented whenever the seasonal low pressure area in the south of the Bay concentrates into a depression or a storm. Sometimes these depressions are sufficiently well developed to survive entry into land and may even emerge as depressions in the Arabian Sea. Associated with such depressions, the 'north-east' monsoon current is drawn into the interior of the Peninsula and causes rain in the Bombay Karnataka and neighbouring regions." [1] Figures 5 and 6 show tracks of some storms during the post-monsoon and early winter seasons.[2] Average monthly and annual rainfall statistics are given in Appendix B.

1 From information kindly supplied by the Director General of Observatories, Poona.

2 India Meteorological Department : Scientific Notes. Vol. VII. No. 74. Delhi. 1937. Plate I.

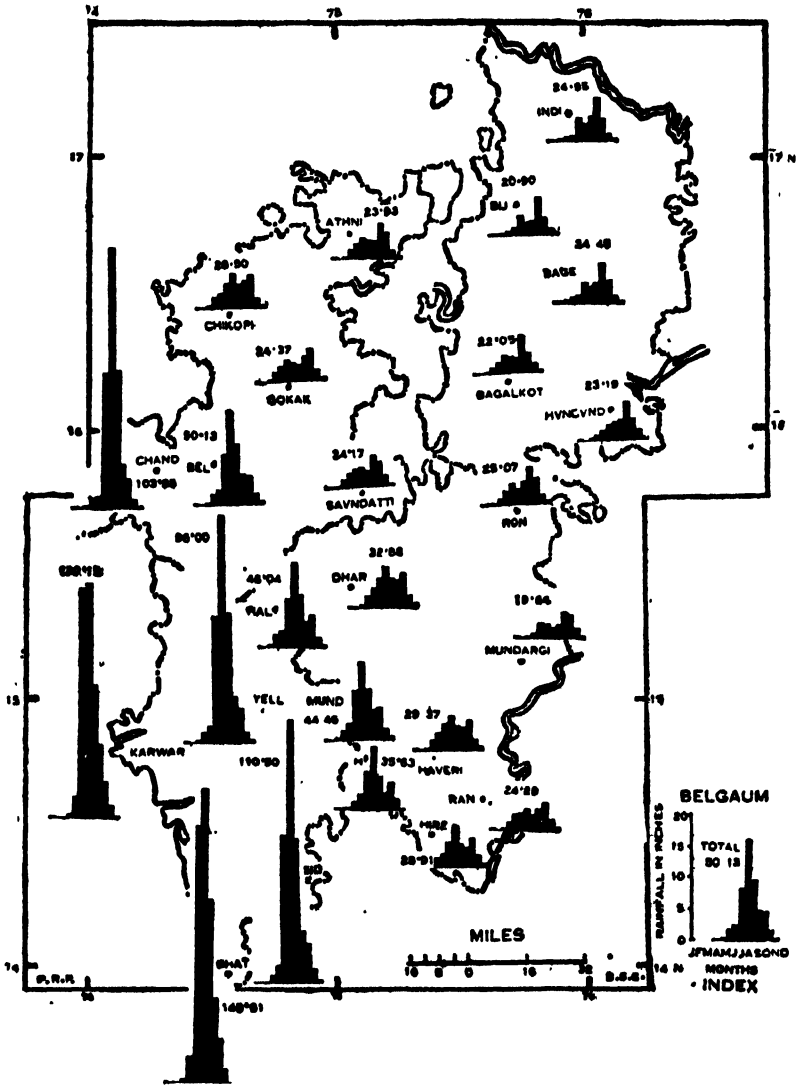

Fig. 7.

Map showing the distribution of Rainfall in the Bombay Karnataka.

The distribution of the rainfall is shown in figure 7. The rainfall may be divided into four main classes:

(i) In the coastal area and the hilly parts of the west rainfall is over 100 inches per annum and occurs almost wholly at the time of the south-west monsoons between June and October. The maximum amount falls in the month of July. Rainfall is plentiful and is sufficient for wet crops like rice. Typical examples are Karwar (120 inches), Bhatkal (149 inches), Siddapur (110 inches) and Chandgad (104 inches).

(ii) In this class the total rainfall is about 50 inches and the maximum fall occurs at the time of the south-west monsoons; still there are some thunder-storm rains both before and after these monsoons. Rains are sufficient and rice and dry crops are grown successfully. Examples are Belgaum (50 inches), Haliyal (46 inches) and Mundgod (44 inches).

In the two classes mentioned above the rainfall is dependable. There is a good cover of vegetation which acts as a regulator of the flow of water, slows up denudation and lessens the frequency of land slips. It is only on the steep and bare hill slopes and the river valleys that the quick moving water erodes the soil in the monsoon months.

(iii) In this class the total rainfall is about 30 inches with definitely two maxima, one in July and the other in October. Therefore, the rains at both the times of the south-west monsoons and the retreat of these monsoons are of equal importance. This makes the rainfall evenly distributed over the year, enabling the growing of both the summer and the winter crops (*Mungari* and *Hingari* crops). The rains are dependable because both the summer and the late rains are not likely to fail in the same year. Examples are Dharwar (33 inches) and Chikodi (29 inches).

(iv) In this class the total rainfall is between 20 and 25 inches and is made up of the pre-monsoon thunder-storm rains, the southwestern monsoon rains and the rains at the time of the retreat of the monsoons. The rainfall is spasmodic and often takes the form of storms of short duration coming in torrents. In these times fertile surface soil is washed away thus leading to soil impoverishment. This class is found in the eastern part of the Bombay Karnataka. The average annual rainfall appears to be high but uncertainty and irregularity are its features; and these parts, therefore, are visited by severe famines every now and then. Although the average works out

to 20 to 25 inches, one year may have a large fall followed immediately by another year with a very low fall. Bijapur, for instance, has the highest figure of 38·88 inches and the lowest of 8·88 inches. * Indi (25 inches), Hungund (23 inches) and Ron (25 inches) are good examples of this class.

VEGETATION.

The natural and artificial vegetation and the amount of rainfall are very well correlated and therefore, the vegetation can, in its turn, be divided into four classes.

In the coastal area and on the Ghats where rainfall is more than 80 inches vegetation consists of dense **evergreen forests** (Plate II. b.). It is true that the Forest Department cuts and sells timber

* In Bijapur out of 48 annual rainfall records the following frequencies have been observed :

Rainfall.	No. of years.
30" to 40"	9
20" to 30"	20
10" to 20"	18
Below 10"	1

These figures have been obtained from 'Dry Farming Methods in the Deccan' by V. A. Tahmane, N. V. Kanitkar and G. M. Bapat, Department of Agriculture, Bombay, Poona. Bulletin No. 142 of 1927. page 2.

from this area but considerable portions of these forests are still untouched. Here and there use has been made of these to supply the local needs such as fuel, animal feeds, timber and loppings for manure, the last of which is used especially by the spice-growers. In the cleared areas naturally grass or bamboo takes a hold. Recently in some places plantations of *Tali* and Sago palms are made in order to supply starch for local consumption. Small areas are given out for the use of tribal people (*Siddi* People) who practise *Kumri* (shifting) cultivation. They are found in the Haliyal, Yellapur and Ankola talukas and Mundgod Peta of N. Kanara and a few are found in the Ghat portions of the Belgaum district. Their cultivation is supervised and controlled both by the Revenue and the Forest Departments. Grass is plentiful though coarse and may be exported to outside areas if required. Among the cultivated crops rice comes first and the other crops include betelnut, spices and cocoanut.

Areas having a rainfall of 40 to 80 inches contain a natural vegetation of **monsoon forest** which exist today in the eastern part of the N. Kanara district and the western part of the Belgaum and the Dharwar districts. Teak, *Nandi*, *Kure Matti*, *Bile Matti*, *Honne*, *Jamba* and sandalwood are the chief timbers commercially exploited. In addition

the forests supply tanning material, gums, catechu, myrobalans, forest fruit and seeds, *apta* or *tumri* leaves for *bidi*-making, leaf manure, grazing and fodder, building material and fuel for local use and for sending out in times of scarcity to other areas. Since 1937 grazing fees have been completely abolished and grass is allowed to be removed from the forest to a certain extent. 1·5 to 4·5 acres of grazing are allowed per cattle. These privileges have been sometimes misused.

The supply of timber from the N. Kanara and the neighbouring forests is sufficient to meet the demand of the whole of the Bombay Karnataka and even parts of the Nizam's Dominions. The Kanara timber does not command a wider market because sea-borne timber from the N. Kanara forests is limited owing to the physical nature of the district while the cost of transport by land prohibits competition with the imported timber at Bombay. Railway sleepers can be brought from Rangoon and even from Australian ports at a fraction of the cost of the railway freight from N. Kanara to Bombay. Thus the transport difficulties, scarcity of labour and lack of capital have hindered the full exploitation of these forests for commercial purposes. Kanara timber, though strong, is very susceptible to the attack of white ants. The Forest Research Institute

has perfected a process of treatment by a preservative called *Ascu* and timber treated this way is immune to the ravages of white ants.

The Forest Survey and Conservancy was started in the year 1847 when the first Conservator of Forests was appointed. Since then the Department has developed a good deal. In order to exploit the forests scientifically the Forest Department has under its direct control areas of **reserved forests.** Here the trees are properly looked after and renewals are made in the felled areas to a certain extent. Even whole plantations are made in places. The Revenue Department holds some 'open forests' which are merely pasture lands and fodder reserves. They also hold some areas covered with trees called ' protected forests ' which are set aside for providing lopping for manure. "Forest is a thing valuable in itself and in truth just as essential to the community as wheat, sugar or cotton." * Continuity of a fixed forest policy, therefore, is essential. Forests are a great asset of the Bombay Karnataka. It is a recognised fact that the forest wealth has not been properly utilised: with the resources of nearly three million acres of forest industries such as paper, rayon, rope, coir, wood distillation, etc., could have been developed.

* Government of India Despatch of 1862 quoted from ' The Bombay Forests ' by W. E. Copleston. 1925. p. 5.

Only recently attempts are being made by private organisations to utilise the forest resources. In the more habitable areas of the monsoon forests rice and sugarcane are the chief cultivated crops.

As the rainfall gradually decreases towards the east the forests give place to grass lands studded with trees called **'Park lands'**. Here most of the land is cultivated and crops grow fairly well. Millets like *jola*, *sajje*, etc., cotton, groundnut, other oil-seeds and pulses are the important crops. When supplemented by irrigation the lands yield excellent crops.

In the eastern talukas of the Dharwar district and the whole of the Bijapur district **scrub forest** and **poor grassland** had formed the natural vegetation. The still-remaining dry scrub forests of Gokak, Bagalkot and Badami (containing acacia, neem, tamarind, banyan, etc.) supply the local demands for fuel, building material and agricultural implements. They are not of any particular commercial value to the Forest Department but their preservation is in the interest of the agriculturists. Most of the land in this area is utilised for growing dry crops like *jola*, cotton, pulses, oil-seeds, etc., and where soils are retentive of moisture *Hingari* crops are grown. But the inadequacy, uncertainty and irregularity of rainfall are the deciding factors.

It is seen from the foregoing considerations that rainfall, soils and vegetation, both natural and artificial, are positively correlated. Where rainfall is very heavy, leached red soils or poor sandy soils are usually found; and vegetation is either evergreen or monsoon forests or crops that require large quantities of water. In the transition belt soils are either loamy or clayey and the number of varieties of crops is large. In the east soils are retentive and black. On account of the small amount of rainfall there is not much leaching of soluble materials and there is accumulation of organic matter.* Thus natural fertility and the amount of rainfall are negatively correlated. This statement may not apply to every case and may even be locally contradicted on account of, for instance, the nature of rock or a cover of alluvium; but the broad generalisation holds good.

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* Where the land is much sloping or undulating gullies and *nallas* have been formed and a good deal of washing has taken place here too.

CHAPTER IV

Cultivated and uncultivated areas

TABLE III gives the total cultivated and uncultivated areas for the year 1937-'38. The detailed taluka statistics are given in Appendix C. These are the latest available figures and the season was not very far from the normal. From the table it is clear that out of a total of twelve million acres, for which agricultural statistics are available, eight and a quarter million acres are cultivated and the remaining are uncultivated. A detailed examination brings out the following features. In the cultivated area nearly a million acres are left **fallow** every year. Reasons for this system are many. Firstly, fallow land in the western parts of the Dharwar and the Belgaum districts and in the cultivated area of the N. Kanara district is largely due to the attack of wild pigs and sparse population resulting from prevailing diseases and emigration. Fallow in the Bijapur district is largely due to the poor nature of the soil owing to soil erosion. There is, secondly, a little true rotation–fallow which may be due to the paucity of rainfall or the poverty of soil or both. In this case the land is left fallow for a year or so and the moisture and plantfood are conserved, by the repeated workings of the soil, for the use of the next year's crop. Thirdly, water-logging

TABLE III

Cultivated and Uncultivated Areas in the Bombay Karnataka in the year 1937–'38.

District.	Area for which agricultural statistics are available.							
	Total area.	Area Cultivated.			Area Uncultivated.			
		Net cropped area. Acres.	Fallow. Acres.	Total Cultivated. Acres.	Available for cultivation. Acres.	Not available for cultivation. Forest. Acres.	Not available for cultivation. Others. Acres.	Total Uncultivated. Acres.
Belgaum.	2,937,751	1,880,744 or 64·1%	333,896 or 11·4%	2,214,640 or 75·4%	53,075 or 1·8%	450,001 or 15·3%	220,035 or 7·5%	723,111 or 24·6%
Bijapur.	3,653,528	2,907,048 or 79·6%	337,663 or 9·2%	3,244,711 or 88·7%	38,226 or 1·0%	173,994 or 4·8%	196,597 or 5·4%	408,817 or 11·2%
Dharwar.	2,949,908	2,249,085 or 76·3%	183,367 or 6·2%	2,432,452 or 82·5%	37,851 or 1·3%	236,145 or 8·0%	243,460 or 8·3%	517,456 or 17·6%
North Kanara.	2,527,059	226,706 or 9·0%	104,870 or 4·1%	331,576 or 13·1%	58,025 or 2·3%	2,063,913 or 81·7%	73,545 or 2·9%	2,195,483 or 86·9%
Total.	12,068,246	7,263,583 or 60·2%	959,796 or 8·0%	8,223,379 or 68·2%	187,177 or 1·6%	2,924,053 or 24·2%	733,637 or 6·1%	3,844,867 or 31·9%

N. B. The taluka statistics are given in appendix C.

* Season and Crop Report of the Bombay Province for the year 1937—'38. Government Central Press, Bombay. 1939. pp. 38—43.

is an important cause for fallowing especially in the N. Kanara district. Some land is fallow on accout of the poverty of the farmers. Finally, the habit of litigation accounts for a large proportion of the fallows. None of the litigants likes to cultivate the land as long as the result of the suit is uncertain.

Amongst the fallows the Bijapur district has the highest area and N. Kanara has the lowest; but if the percentage of fallow land to the total cultivated land is considered the Belgaum district comes on top with 11·4%, next comes the Bijapur district and last comes N. Kanara. It is true that the loss of the national income due to fallowing is partly, and only partly, compensated by the system of **double cropping.** Usually rice and irrigated lands are double cropped. After the *Mungari* rice is harvested the soil has sufficient moisture left in it and this is utilised by a winter crop like lentils, gram, wheat, beans, vegetables, etc. In some areas, especially in the N. Kanara district, rice is taken a second time on pond irrigation. The double cropped areas in the districts of Belgaum, Bijapur, Dharwar and N. Kanara are about 30,000, 21,000, 17,000 and 13,000 acres respectively.

In the total **cultivated area** the Bijapur district, with 89%, stands first mainly because the forest lands and rough grazing are negligible. The Belgaum and

Dharwar districts have between 75% and 82% while N. Kanara has only 13%.

The situation is reversed in the case of the **uncultivated area.** N. Kanara has the highest percentage (87%) and the Bijapur district the lowest (11%). Forests take up the major portion of the uncultivated area in the N. Kanara and Belgaum districts. There is another class of land called "**the area available for cultivation**" which is apparently cultivable land but not cultivated at present. This land might have been once cultivated but the economic depression or long, continued negligence or both might have turned the land into a permanent fallow. It is also possible that some good land might never have been ploughed at all. In future, it may be profitable to pay a little attention to devise methods of bringing such areas under cultivation. Two lakhs of acres (2%) for the whole Bombay Karnataka must receive consideration.

CHAPTER V

Agriculture : Cereals and Pulses

Agriculture

AGRICULTURE is the main industry of the people: 65 to 72 percent of the population live on agriculture. These percentages include workers and their dependents.

Crops are usually grown on rain-water except in a few places where canal, pond or well water is available for supplementing the rainwater. The **total cropped area** (Table IV) is about seven and a quarter million acres. 69% of this is occupied by cereals and pulses, 17% by fibres — mostly cotton —, 7% by oil-seeds, 4% by fodder crops* and the remaining area is taken up by spices and condiments, sugars, drugs and narcotics, fruits and vegetables and other crops. The detailed taluka crop statistics are given in Appendix D.

Cereals and Pulses.

Jola, wheat, rice, *sajje*, maize and hill millets amongst the cereals, and gram, *togari*, *hesaru*, *madaki*, *uddu*, *alasandi*, peas and lentils among the pulses are the important crops.

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* This includes grass areas. The area under pure fodder crops is negligible.

Table showing the acreages of groups of crops in the

District.	Cereals & Pulses.	Oil-seeds.	Spices & Condiments.	Sugars.	Fibres.	Dyes.
Belgaum.	1,341,042	144,156	23,940	13,115	187,037	—
	70·2%	7·5%	1·3%	0·7%	9·8%	—
Bijapur.	2,189,600	230,832	4,625	544	477,503	—
	75·0%	7·9%	0·2%	—	16·4%	—
Dharwar.	1,336,014	159,686	66,022	1,775	579,243	—
	58·8%	7·1%	2·9%	0·1%	25·5%	—
N. Kanara.	166,094	12,242	4,208	2,860	167	2
	68·2%	5·2%	1·7%	1·2%	0·1%	—
Total.	5,033,050	546,916	98,795	18,294	1,243,950	2
	68·5%	7·4%	1·3%	0·2%	16·9%	—

N. B:— The taluka crop statistics are given in appendix D.

districts of the Bombay Karnataka in 1937–38.*

Drugs & Narcotics.	Fodder Crops.	Fruits & Vegeta-bles.	Misc. Food crops.	Misc. Non-food crops.	Total cropped area (gross).	Total net area under crops.
58,574	132,125	10,426	45	22	1,910,482	1,880,744
3·1%	6·9%	0·5%	—	—	100·0%	
1,277	8,896	6,725	2	7	2,920,311	2,907,048
—	0·3%	0·2%	—	—	100·0%	
2,307	114,243	11,012	—	28	2,270,330	2,249,085
0·1%	5·0%	0·5%	—	—	100·0%	
16,993	28,709	7,955	—	4,423	243,653	226,706
6·8%	11·8%	3·3%	—	1·8%	100·0%	
79,151	283,973	36,118	47	4,480	7,344,776	7,263,583
1·1%	3·9%	0·5%		0·1%	100·0%	

* Season and Crop Report of the Bombay Province for the year 1937-'38. Government Central Press, Bombay. 1939. pp. 44–65.

Jola (Great Millet):— *Jola* is the most important cereal in the whole of the Bombay Karnataka except in the N. Kanara district where rice takes the first place. It covers half the gross cropped area in the district of Bijapur, one-third in the district of Belgaum and a quarter in the district of Dharwar. The crop is grown both in rainy (*Mungari*) and winter (*Hingari*) seasons. Table V gives the acreages in the different districts.

TABLE V

Jola acreages in 1937–38.*

District.	*Mungari* crop.	*Hingari* crop.	Total area.	Percentage of cropped area.
Belgaum.	308,066	310,010	618,076	32
Bijapur.	192,245	1,287,129	1,479,374	51
Dharwar.	410,094	136,275	546,369	24
N. Kanara.	465	—	465	—
Total.	910,870	1,733,414	2,644,284	

It is seen that in the Belgaum district the *Mungari* and the *Hingari* crops are almost equal; in the Bijapur district the crop is predominantly a *Hingari*

* Season and Crop Report of the Bombay Province for the year 1937—38. Government Central Press, Bombay. 1939 pp. 44—65.

crop and in the Dharwar district about three-fourths is *Mungari.* The reason is found in the distribution of rainfall. In the Belgaum district wherever *Jola* is grown the rains are certain and comparatively well distributed; in the Bijapur district rains during the last months of the year are more certain; and in the Dharwar district the *Mungari* rains are more dependable.

Jola is a sub-tropical crop and requires a warm and dry climate with a rainfall between 20 and 40 inches It is not, therefore, uniformly distributed in all parts of these districts. (Fig. 8). It is an unimportant crop in the southwest of the Belgaum district, namely in the talukas of Khanapur and Belgaum and Chandgad Peta. The talukas of Athni and Gokak have the largest acreages. In the Bijapur district it is a general crop; and so also it is in the Dharwar district except in the talukas of Kalghatgi, Hangal and Kod.

Another peculiarity about the *jola* crop is that almost invariably the *Mungari* crop has a mixture of pulses like *togari, hesaru, madaki, alasandi,* etc. Usually every fourth row (where a four coulter drill is used) is sown with either only a pulse seed or pulse seed mixed with *jola* seed. This system has many advantages. Firstly, the pulses, being leguminous

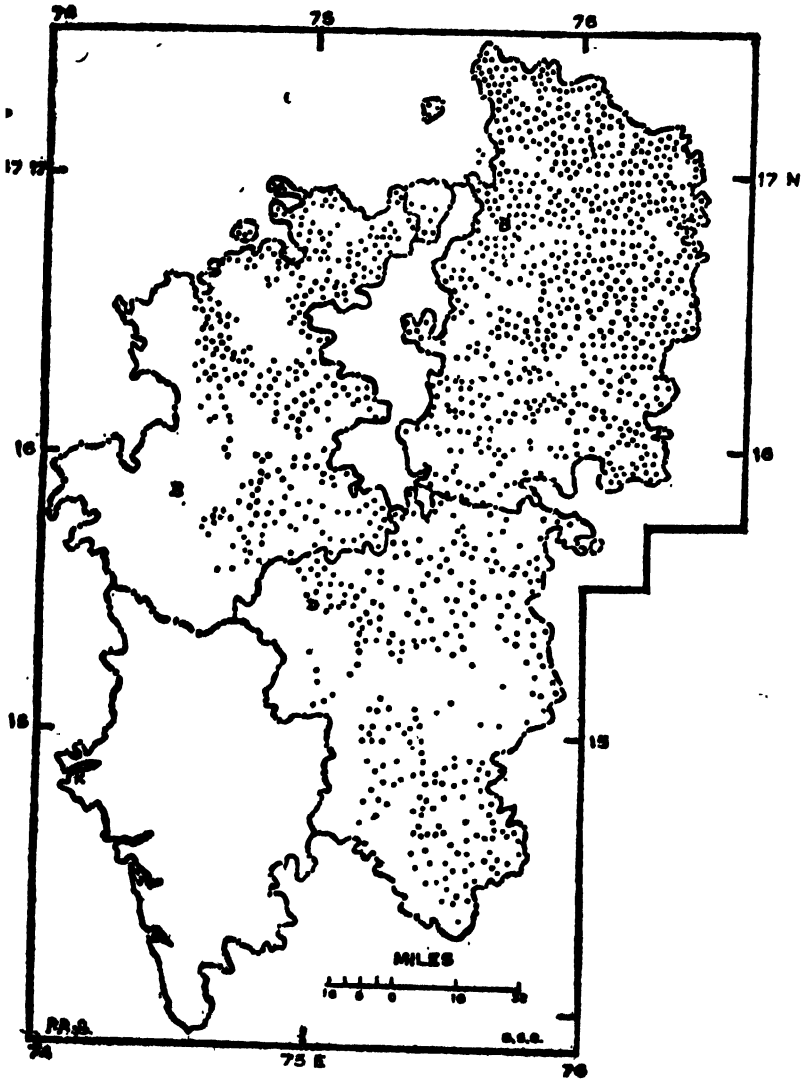

Fig. 8

The distribution of JOLA in the Bombay Karnataka.

Each dot represents a,ooo acres.

crops, enrich the soils by fixing the atmospheric nitrogen with the help of the nodular bacteria that are found on their roots. Secondly, most of the pulses are deep-rooted and have a longer season of growth. They make use of the moisture and plant food from the deeper layers of the soil and also after the main crop is harvested. This applies especially to *togari*. *Togari* is a very small crop until the harvest of *jola*; afterwards it grows at a tremendously fast rate and covers almost the entire field. Thirdly, pulses are an insurance against a complete failure of crop. The main crop may fail but the pulse crop tries to make up for the loss at least partially.

The *Hingari* crop is usually sown alone or with a mixture of safflower or linseed. It is sown comparatively sparsely as it has to depend more on the conserved moisture. There is a small acreage of hot season *jola* which requires the help of irrigation.

Cultivation of Jola:- Land for the *Mungari* crop is not usually ploughed if soil is heavy but one or two ploughings are given to light soils. Five to ten cart loads of farm yard manure are applied, when available, per acre and mixed well with a harrow. Sowing is done in July by a three or four coulter drill spaced at 12 to 15 inches. The seed-rate is 4 to 8 lb. of *Jola* and about 2 lb. of pulses. Two or

three hoeings and a handweeding are done in order to kill weeds and stir the soil to aerate it. The *Mungari* crop is usually harvested in December or January. Ears may be removed from the plant before cutting or the plants may be cut by a sickle at a height of five to six inches from the ground. The plants are tied in bundles, stacked, dried and removed to a threshing yard. The ears are spread on the floor of the yard and the grain is removed either with the help of a stone roller or under the feet of animals. The yields are about 800 lb. of grain and 1,700 to 2,000 lb. of fodder per acre. The fodder is used as cattle feed. The pulse crop yields about 200 to 300 lb. of grain and a small, but nutritious, quantity of fodder.

For the *Hingari* crop land is ploughed in the hot weather and repeatedly harrowed in the rainy season. 4 to 8 lb. of seed are sown per acre in September or October with a three coultered drill. One or two inter-tillings and a handweeding are done. The crop is usually pulled in the month of February or March. The method of threshing is similar to that of the *Mungari jola*. Yields of both the grain and the fodder are less than those of the *Mungari jola* but the fodder is better and a more valuable cattle feed.

Improved strains of *jola* that have been introduced by the Department of Agriculture are selections from *Nandyal, Fulgar Yellow, Fulgar White, Muddinadyal* and *Chowri.* Sulphur dusting and copper sulphate steeping of seed against smut, method of checking stem-borers, use of stone roller, use of *pudrette* manure, etc., have been recommended by the Department. Work is going on in the selection and breeding of seed and various methods are devised from time to time to combat diseases and pests, e. g. Barium Carbonate poison against field rats. Dry Farming methods have been recommended in areas receiving small and uncertain rainfall.

Wheat:— Wheat is the second important cereal in the Bombay Karnataka. Table VI gives the

TABLE VI.

Wheat acreages in 1937–38.*

District.	Total acreage.	Percentage of gross cropped area.
Belgaum.	140,364	7
Bijapur.	226,371	8
Dharwar.	283,854	13
N. Kanara.	1	—
Total	650,590	

* Vide foot-note on page 52.

acreages in 1937-38 and the map (Fig. 9) shows the distribution of the crop. It is seen that wheat is an important crop in the Dharwar district and is completely absent in the N. Kanara district. In the districts themselves the crop is not evenly distributed. Wheat is

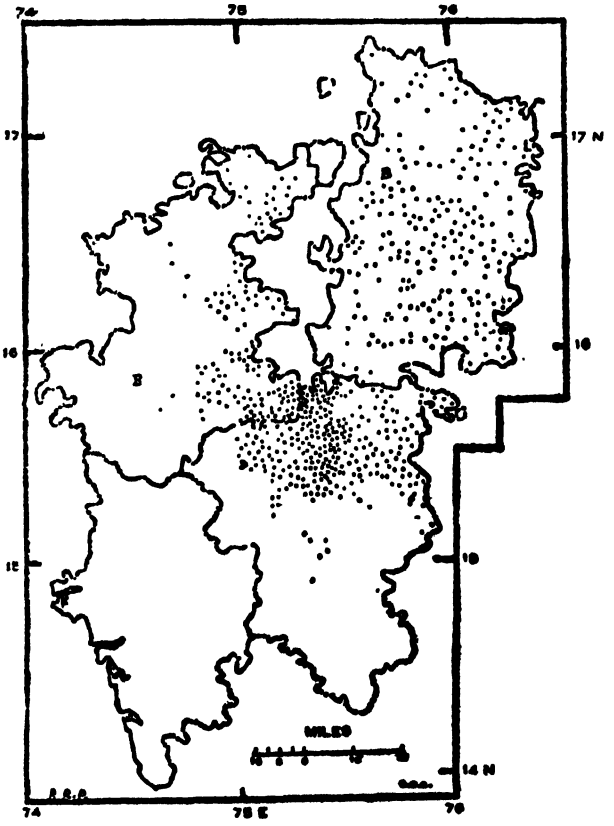

Fig. 9.
The distribution of WHEAT in the Bombay Karnataka.
Each dot represents 1,000 acres.

a *Hingari* crop. Soil, therefore, should be of a retentive nature; the climate should be fairly cold; continued cloudy weather induces fungus disease (rust) and the whole crop may be ruined. At the time of harvest the climate should be warm and dry. Wheat is grown in only those areas which satisfy the soil and climatic requirements. The Parasgad taluka alone contains half the wheat acreage of the Belgaum district. Next in order are the Athni, Gokak and Sampagaon talukas. It is a general crop in the Bijapur district. The Navalgund taluka with Nargund Peta has about half the wheat acreage of the Dharwar district; next come the Gadag, Ron, Hubli and Dharwar talukas. It is very unimportant in the western talukas of the Dharwar district. Wheat is also grown as an irrigated crop in the north of the Bijapur district. It is mostly *Khapli* variety.

The preparation of land for dry wheat is similar to that for *Hingari jola*. Manuring is very rarely done. About 40 lb. of seed are sown per acre in the latter half of October or in November by means of a heavy drill and the lines are spaced about a foot apart. Mostly safflower is grown as a mixture. The crop may not be hoed at all. Harvesting is done in February or March by uprooting the plants. The plants are bundled, stacked, dried and finally grain is separated by means of a saw-teeth thresher or simply

under the feet of animals. The yield of grain is 400 to 600 lb. per acre. The chaff is used as cattle feed.

Irrigated wheat is usually grown on lighter soil and good tilling and manuring are necessary. The seed-rate and yield are respectively 80-90 lb. and 1,000 lb. per acre.

Usually the *Khapli* variety which is hard and rust-resistant, is grown in the Bombay Karnataka. It is more nutritious than soft wheat. The Agricultural Department has introduced rust-resistant and early varieties in some parts.

Rice:— Rice is the most important cereal in areas getting a large amount of rainfall. It is grown

TABLE VII.

Table showing the rice acreages in 1937-38. *

District.	Total acreage.	Percentage of gross cropped area.
Belgaum.	120,236	6
Bijapur.	5,262	-
Dharwar.	137,861	6
N. Kanara.	156,845	64
Total.	420,204	

* Vide foot-note on page 52.

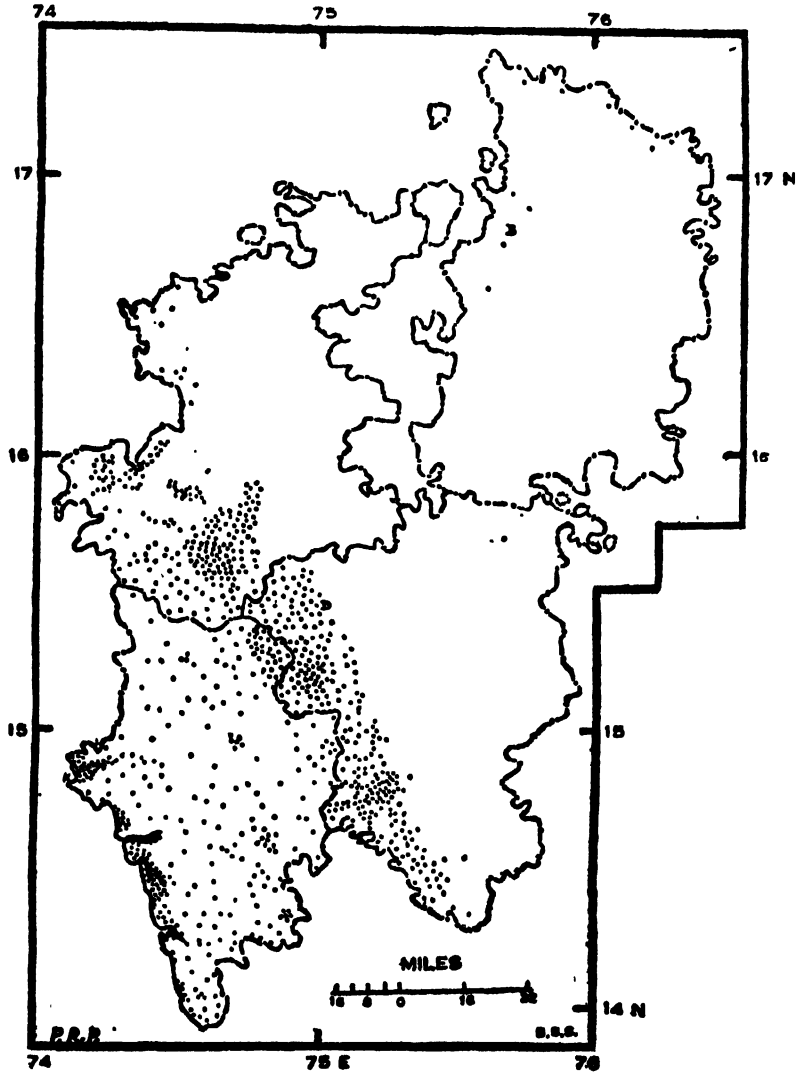

Fig. 10.

The distribution of RICE in the Bombay Karnataka.

Each dot represents 500 acres.

to some extent on tank (pond) irrigation in the Dharwar, Belgaum and N. Kanara districts. Table VII gives the acreages in 1937–38 and the map (Fig. 10) shows the actual distribution of the crop. It is seen that rice is the important crop of the N. Kanara district and is a very minor crop in the Bijapur district. In the N. Kanara district the Haliyal taluka, all the Below-Ghat talukas and the Sirsi taluka have the largest acreages, while the Supa Peta and the Yellapur taluka have the lowest acreages. Rice is grown everywhere but the total acreage depends upon the available level ground free from forests. The map shows that the southwestern part of the Belgaum district and the western part of the Dharwar district grow a large amount of rice. The talukas involved are Belgaum, Khanapur, Chandgad Peta and the western part of Sampagaon in the Belgaum district, and Hangal, Kalghatgi, Dharwar, Kod and Bankapur in the Dharwar district.

Rice is a tropical crop growing actually in water. It requires level ground — therefore terracing is practised in hilly areas —, hot and moist climate and more than or about 40 inches of rainfall for a dry crop. It ripens in a period of three to five months according to variety. The top layer of the soil should be able to hold water. The crop is mostly a drilled crop in the eastern part of N. Kanara and in the

Belgaum and the Dharwar districts. In the Sirsi and Siddapur talukas and the Below-Ghat area of the N. Kanara district the crop is transplanted. Soil is carefully prepared and seed is sown at the rate of 40 to 80 lb. per acre in June and sometimes as early as the middle of May. For transplanting the seedlings are grown in a nursery and transplanted into puddled fields in small bunches. A heavy plank is passed over the field: this operation buries the weeds while the rice plants recover due to their rigidity. This practice encourages tillering. Yield is about 1,200 to 2,000 lb. of paddy to an acre. The transplanted crop yields more than the sown crop. The *Vaingan* (summer) rice is irrigated. The yield is more in irrigated area than in unirrigated area because large quantities of water and manure are given to the irrigated crop. Yearly two crops can be grown in the irrigated areas. Improved varieties of seed have been introduced by the Agricultural Department, for instance, Mugad No. 161 and Antarsal No. 67 (early varieties), Mugad No. 81 and Antarsal No. 90 (intermediate varieties), and Mugad No. 141 and Antarsal No. 200 (late varieties) for the drilled area of the Belgaum and the Dharwar districts, and Jaddu No. 1061, Muskaty No. 1315 and Red Halgar No. 244 for the transplanted area of the N. Kanara district.

Other Cereals:– **Sajje** is the important crop among the remaining cereals and is grown either on

poor soils or in areas where rainfall is low. In the Bijapur and the Belgaum districts 11 and 8 percentages of the cropped areas respectively are under *sajje*. **Barley** is grown in the northern part of the Bijapur district and in the Athni and the Gokak talukas of the Belgaum districts. It is absent in the Dharwar and the N. Kanara districts. In some areas barley is an irrigated crop. **Maize** is an important crop of the Gokak, Chikodi and Hukeri talukas where it is irrigated. The **hill millets** are *ragi*, *savi*, *navani*, etc., and they are grown on poor land in all districts.

Pulses:– Pulses are usually grown as mixtures with cereals but *hurali*, lentils, gram and peas may be grown as entire crops. Gram is an important pulse in the Athni taluka of the Belgaum district. In the Bijapur and the Dharwar districts one or the other pulse is grown in all the talukas. In N. Kanara pulses are unimportant; only *hesaru* and *uddu* are grown to some extent. The total pulse acreages in the Belgaum, Bijapur and Dharwar districts are 275,000, 150,000 and 200,000 acres respectively. Pulses supply the most nutritious and tasty part of the vegetarian diet.

CHAPTER VI

Agriculture—Fibres

THE following crops are included in the fibres: cotton, jute, Deccan hemp, Bombay (*Sann*) hemp, Sisal hemp, Cocoanut, etc. In the Bombay Karnataka all the above fibres are grown excepting jute; and among them cotton occupies the foremost place. The acreages of the fibres are given in Table VII and the distribution of the cotton crop is shown in Fig. 11.

TABLE VIII.

The acreages of fibres in 1937-38.*

District.	Cotton.	Others.	Total.	Percentage of total cropped area.		
				Cotton.	Others.	Total.
Belgaum.	178,205	8,832	187,037	9	1	10
Bijapur.	472,699	4,804	477,503	16	—	16
Dharwar.	573,604	5,639	579,243	25	—	25
N. Kanara.	—	167	167	—	—	—
Total.	1,224,508	19,442	1,243,950			17

* Vide foot-note on page 52.

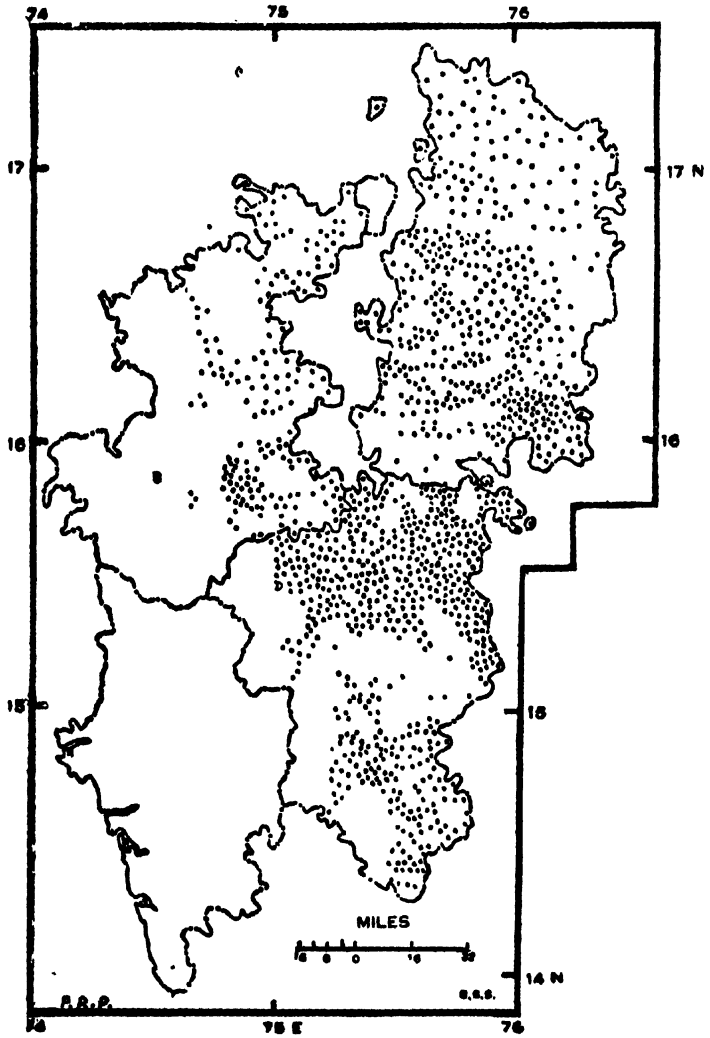

Fig. 11.

The distribution of COTTON in the Bombay Karnataka.

Each dot represents 1,000 acres.

It is seen that 25 percent of the total cropped area of the Dharwar district and 16 percent of that of the Bijapur district are occupied by **cotton.** Cotton is, in fact, the second most important crop from the point of view of area and the first crop from the monetary point of view.

The detailed distribution of cotton is again dependent upon soil, climate and the available transport facilities. Cotton is a tropical and sub-tropical crop and requires a long season of warm climate with a rainfall between 20 and 40 inches. In the vegetative stage cotton requires less sunshine and more moisture and in the fruiting stage more sunshine and less moisture; in the picking stage there should be no rainfall. Cotton is killed by continued frost. Soils should be deep and well drained and should be retentive of moisture. From the point of view of climate and soil some parts of the Belgaum, Bijapur and Dharwar districts are suitable for cotton. In the Belgaum district only the eastern talukas can satisfy these conditions and the largest area is therefore found in the Parasgad, Athni, Gokak and Sampagaon talukas. It is grown everywhere in the Bijapur district; but the Bagalkot, Hungund, Bagewadi and Bijapur talukas have very large acreages. In the Dharwar district also it is grown everywhere, but the concentration is to be found in the eastern talukas

and eastern parts of the other talukas; the Navalgund taluka has more than 20 percent of the crop, the Ron taluka about 18 percent and the Gadag taluka about 16 percent. Next in order are the talukas of Karajgi, Hubli, Ranibennur and Dharwar. Cotton is not grown in N. Kanara.

Generally two kinds of cotton are grown in the Bombay Karnataka; they are the Kumta-Dharwar *(jawari)* and the Dharwar-American or Upland (*Vilayati*) varieties of cotton. Both of them are long-stapled cottons. The Kumta-Dharwar cotton is an indigenous plant while the Dharwar-American cotton was introduced after the advent of the East India Company. About 44 percent of the cotton grown in the Ron taluka and about 7 percent of the cotton grown in the Navalgund taluka are shown in the taluka statistics as the Cambodia variety but they are, in fact, the American variety wrongly called by the people as Cambodia cotton. The Cambodia variety is grown to a small extent on well-irrigation in the Gadag and Gokak talukas and gives a heavy yield.

Land is ploughed as soon as the anti-monsoon showers make the land workable. Usually the crop is not manured, the remnant manure applied to the previous crop being quite sufficient. In the early

part of the monsoon months the land is harrowed twice or thrice and the crop is sown in August in the north and west and in September in the south and east of the Bombay Karnataka. 8 to 10 lb. of seed are drilled in rows 18 to 24 inches apart, usually without any mixture; but in some places *jola* or *navani* is used as a mixture. Two or more inter-tillings and a handweeding are done. Picking begins in March and lasts upto May. Three to four pickings are done, the second one being the heaviest and the best. Yield is between 200 and 350 lb. of seed-cotton per acre.

Cotton is the most important of the cash crops. Farmers almost invariably sell the whole of the cotton either in their own villages to visiting merchants or in a nearby urban market to merchants or gin-owners. The seed-cotton is sold to a ginner either through a broker or through a producers' co-operative sale society. Most of the lint-cotton is sent out of the Bombay Karnataka and only a small portion is used in the mills at Hubli, Gadag and Gokak. Hubli, Gadag, Bagalkot, Bijapur, Dharwar, Bailhongal, Savanur, Athni, Kagwad, Nargund, Ranibennur, and Haveri are the chief cotton markets. Bailhongal has a regulated cotton market. In order that the purity and the reputation of the local cottons should be kept up the Bombay Karnataka is divided

into three groups,* viz. Bijapur, Bagalkot and the Kumta groups. Exchange of cotton amongst these groups is not allowed except under a licence. Similarly a permit is required to import outside cotton into the Bombay Karnataka.

The Agricultural Department has introduced on a large scale two improved cottons, viz. **Jayavant** in the Kumta area and **Gadag No.1** in the Dharwar-American area. *Jayavant* occupies an area between 600,000 and 700,000 acres and Gadag No. 1 about 125,000 acres. Both these varieties bring a good premium over the local varieties and the cultivators are benefitted to the extent of about Rs. 200,000 every year.

In the Bombay Karnataka the remaining fibres are of minor importance as they are grown to meet only the local demand. **Deccan hemp** (*pundi*) is grown usually as a mixture in a cereal crop. **Sann hemp** is almost wholly used for green-manuring in the irrigated areas. **Agave** (*kalnaru*) is another fibre plant giving coarse fibre. It is planted along field borders and by the sides of railway lines.

CHAPTER VII

Agriculture—Oil-Seeds

THE most important oil-seeds that are grown in the Bombay Karnataka are groundnut, linseed, sesame, castorseed, safflower, nigerseed and cocoanut. Table IX gives the acreages of the various oil-seeds in the different districts.

TABLE IX.

Acreages of oil-seeds in 1937-38.*

Crop.	Belgaum district.	Bijapur district.	Dharwar district.	North Kanara dist.	Total.
Groundnut.	96,193	89,377	81,435	193	267,198
Linseed.	3,721	36,829	10,491	7	51,048
Sesame (*Yellu*).	2,194	9,138	7,279	72	18,683
Castorseed.	733	1,680	3,639	25	6,077
Cocoanut.	6	9	446	11,646	12,107
Rape & Mustard.	109	—	366	—	475
Others.	41,200	93,799	56,030	299	191,328
Total.	144,156	230,832	159,686	12,242	546,916
Percentage of Total cropped area.	8	8	7	5	

* Vide foot-note on page 52.

It is seen that the oil-seeds as a whole occupy between five and eight percent of the total cropped areas of the different districts. Groundnut requires dry climate and loose soil and is therefore grown on the sandy and the loamy soils of these districts. In some places it is also grown in the black soils. In the last twenty years or so the area under groundnut has increased tremendously. Formerly sandy soils could grow only coarse millets; but once groundnut was popularised this type of soil was and is successfully utilised to produce good crops. In addition groundnut, being a leguminous crop, enriches the otherwise poor soils and the rotation crops derive the benifit.

Figure 12 shows the distribution of the groundnut crop. In the Belgaum district the talukas of Hukeri, Chikodi, Athni and Parasgad grow more than 80 percent of the crop. In the Bijapur district the concentration is very marked in the talukas of Badami, Indi, Hungund and Sindgi. In the Dharwar district the three talukas of Gadag, Ron and Ranibennur grow between them about 88 percent of the crop. It is absent in the N. Kanara district. Spanish Peanut Strain 5 (erect variety) and Pondicherry Strain 8 (spreading variety) are recommended by the Department of Agriculture. The former is short-seasoned and a *Hingari* crop like wheat or gram may be taken on the same field if the soil is fairly

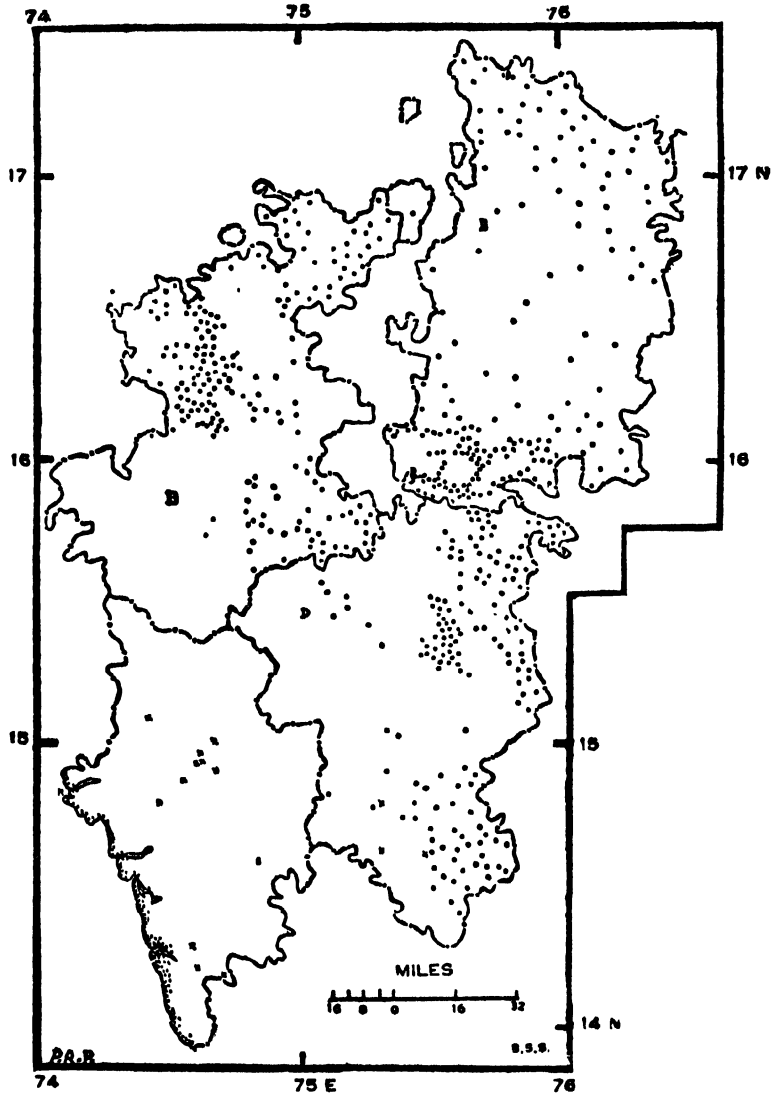

Fig. 12.

The distribution of GROUNDNUT and COCOANUT in the Bombay Karnataka.

Each dot represents 500 acres of groundnut and each cross, 100 acres of cocoanut.

heavy. Pondicherry is a long-seasoned crop and yields more than the Spanish Peanut.

Linseed is an important oil-seed of the Bijapur and the Dharwar districts. In the former the crop is grown in all the talukas and especially in the talukas of Bagewadi and Sindgi, and in the latter the talukas of Ron, Navalgund and Gadag have the largest acreages. It is a ***Hingari*** crop and is grown either as an entire crop or as a mixture with other ***Hingari*** crops. The seed, oil and cake are in great demand for export purposes. **Safflower** (*Kusibi*) is another oil-seed and its acreage rivals with that of groundnut. It is a ***Hingari*** crop and requires deep and retentive soils. Large quantities are, therefore, grown in the talukas of Parasgad and Athni of the Belgaum district, all the northern talukas of the Bijapur district and the talukas of Navalgund and Gadag of the Dharwar district.

Cocoanut is an important oil-seed of the N. Kanara district and is practically absent in other places. In the N. Kanara district itself the bulk of the crop is grown in the Below-Ghat talukas. Cocoanut is grown on sands along the beach. (Plate IV. b.). The crop requires a certain amount of common salt and this is found in the soils along the beach. Denatured salt and salt from the fish curing yards are also

used as manure. Figure 12 shows the distribution of this crop.

The chief of the remaining oil-seeds are sesame, castorseed and nigerseed. Castorseed is to be specially mentioned because the Bijapur and the Dharwar districts produce a good proportion of the castorseed of the Bombay Presidency and of India.

Most of these seeds give edible oils. The oils from sesame, safflower and nigerseed are mostly consumed in the districts themselves and only a a small portion is exported to Konkan and other places. The groundnut oil was not popular as a cooking medium in former days, but now-a-days it is used by all classes of people for cooking purposes. A good deal of the groundnut oil is used for the manufacture of soaps. Castor oil is used for medical and for lubricating purposes. Linseed oil is used for the manufacture of paints and varnishes. All the oilcakes, except that of castorseed, are nutritious cattle feeds; groundnut cake, safflower cake and castor cake are used as artificial manures. The overseas demand for these products and the great development of the soap and other chemical industries in India after the great war have made the growing of oil-seeds, especially groundnut, a profitable concern.

CHAPTER VIII

Agriculture—Other Crops

Drugs and Narcotics

THE term 'drugs and narcotics' is almost synonymous with tobacco in the Belgaum and the Bijapur districts and with betelnut in the N. Kanara district. The acreages are given in Table X.

TABLE X.

The acreages of Drugs and Narcotics in 1937-'38.*

District.	Tobacco.	Coffee.	Tea.	Others.	Total.
Belgaum.	57,705	—	6	863	58,574
Bijapur.	1,123	—	—	154	1,277
Dharwar.	622	—	—	1,685	2,307
N. Kanara.	—	4	—	16,989	16,993
Total.	59,450	4	6	19,691	79,151

Tobacco is not a general crop in the districts. It is pre-eminently a crop of the Chikodi and the Hukeri talukas of the Belgaum district (Fig. 13), where it is

* Vide foot-note on page 52.

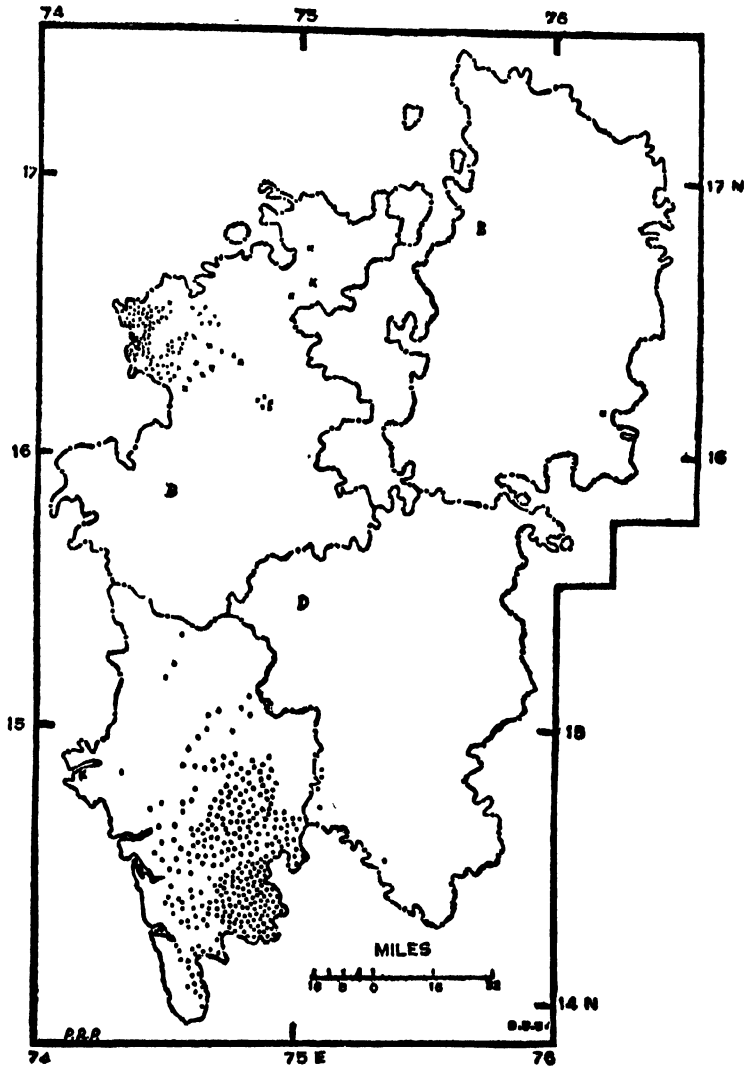

Fig. 13.

The distribution of TOBACCO and BETELNUT in the Bombay Karnataka.

Each cross represents 500 acres of tobacco and each dot, 50 acres of betelnut.

grown in gardens, in small plots near villages and along rivers and streams. Nipani is a well known market town for tobacco. The Agricultural Department has introduced a variety from Gujarat (Nadiad No. 6) which yields better than the local variety.

In the N. Kanara district most of the area included in the 'others' column of the table is used for **betelnut.** Betelnut and spice gardens are very common at the head of deep valleys in the Ghat area, especially in the Siddapur and the Sirsi talukas. (Fig. 13 & Plate III. a.). *Koleroga*, a fungus disease on betelnut is an annual visitor and causes serious damage. Spraying with Bordeaux mixture (a fungicide) and *Kotte*-tying (covering the flower bunches with betelnut sheaths-*Kotte*) are practised to combat the disease. Another crop worth the mention is **betel-leaf.** It is grown largely in the Chikodi and the Athni talukas of the Belgaum district, in the talukas of Honavar, Siddapur, Sirsi and Bhatkal Peta of the N. Kanara district, and the talukas of Ranibennur, Karajgi, Kod, Hangal and Bankapur of the Dharwar district.

These crops, though small in acreages, are valuable from the monetary point of view. Large amounts of labour and capital are required to cultivate small areas and the cultivation is a specialist's job. However, they pay abundantly for the trouble taken in growing them.

Sugars.

Sugarcane is the chief plant used for the extraction of sugar. It can be grown in areas receiving heavy rainfall or where irrigation facilities are available. It is grown in the Chikodi, Hukeri and Belgaum talukas of the Belgaum district (Fig. 14), and on a small scale in all the talukas of N. Kanara.

Sugarcane is a long seasoned crop and requires good soil, large quantity of water throughout the year, a great amount of capital and a special knowledge of cultivating the crop. It is, therefore, grown only where there is certainty of water.

J. 213 and Co. 419 are hardy varieties and have been recommended in areas where water supply is likely to be scarce and Ek. 28 and H. M. 544 have been recommended in areas where there is an abundant supply of water. The yield of the improved varieties is about 8,000 lb. of jaggery per acre which is 2,000 lb. more than that of the local variety. Ridge and furrow method of cultivation has been recommended by the Department of Agriculture.

Spices and Condiments

Chillies, onion, garlic, pepper, cardamum, tumeric, ginger, etc., are included under spices and condiments. The acreages are given in Table XI.

TABLE XI.

Acreages of spices and condiments in 1937–'38. *

District.	Acreages.
Belgaum.	23,940
Bijapur.	4,625
Dharwar.	66,022
N. Kanara.	4,208
Total.	98,795

Even though N. Kanara is popularly considered to be a spice district taken as a whole, the Dharwar district has nearly two-thirds of the area under these crops. 62 percent of the area under spices and condiments in the Dharwar district is found in the Kod taluka. The Ranibennur and Karajgi talukas come next in order. In the Belgaum district the Hukeri, Chikodi, Sampagaon and Gokak talukas grow a good deal of these crops. They are minor crops in the Bijapur district. In these three districts viz., Belgaum, Dharwar and Bijapur, the spices and condiments are almost synonymous with **chillies, garlic** taking the next but a very unimportant place. **Black pepper** is confined to N. Kanara; and here 2620

* Vide foot-note on page 52.

acres out of a total of 2,827 acres are found in the Sirsi (1,337 acres) and Siddapur (1,283 acres) talukas. The creepers are trained on the betelnut palms. The distributions of chillies and pepper are shown in Fig. 15. Byadgi is a well known market for chillies

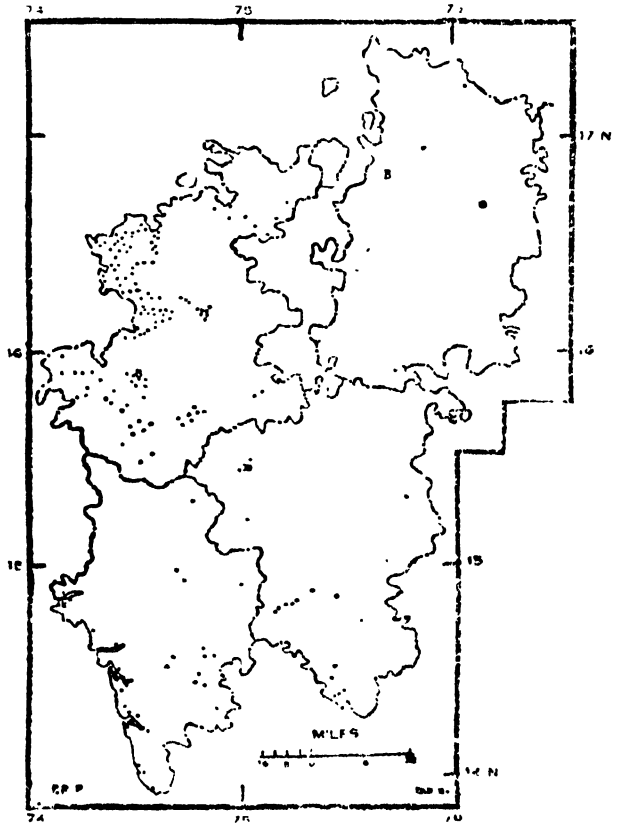

Fig. 14.

The distribution of SUGARCANE in the Bombay Karnataka.
Each dot represents 100 acres.

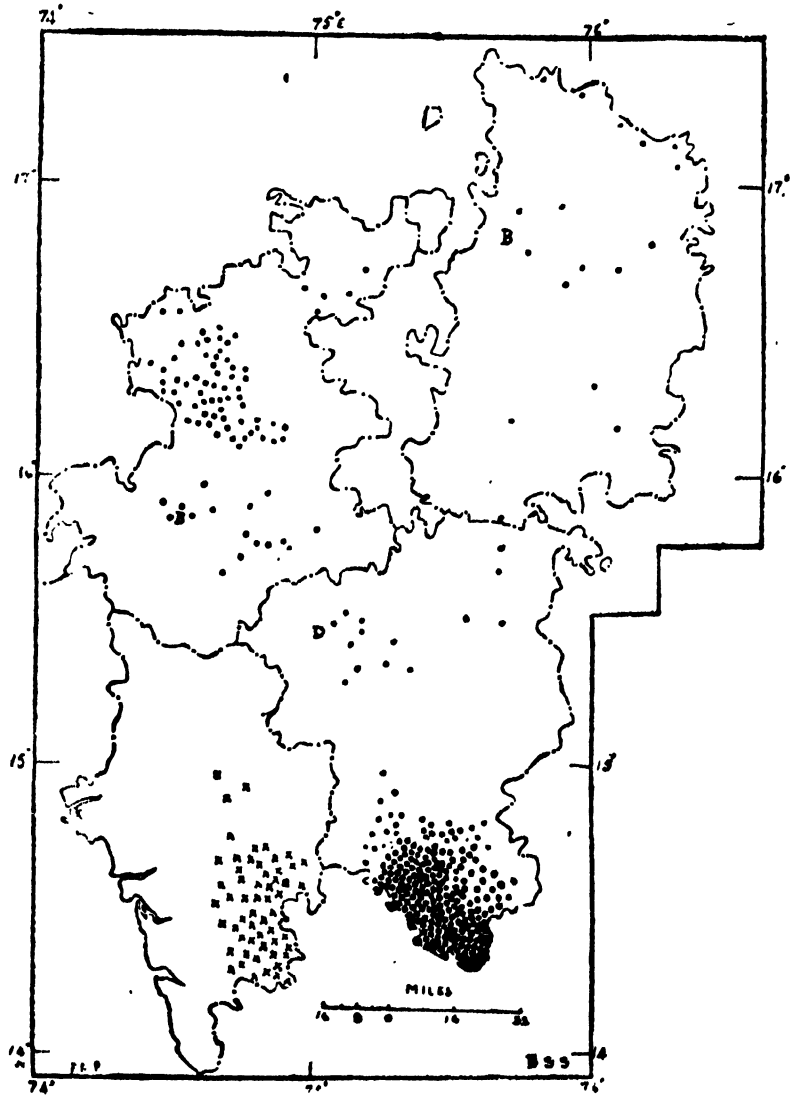

Fig. 15.

The distributions of CHILLIES and PEPPER in the Bombay Karnataka.
Each dot represents 250 acres of Chillies and each cross 50 acres of pepper.

and pepper and Haveri for cardamums. It may be stated here that betelnut, pepper, cardamum and plantain are grown in the same garden simultaneously.

Orchard and Garden Crops.

Various vegetables, fruits and flower trees are included in this category. One or the other of these is grown in every taluka. Large quantities of **vegetables** are grown near large settlements. **Mango** is an ubiquitous tree but good mangoes come from the western part of the Bombay Karnataka. **Guava** plantations are very common round about the Dharwar town. **Pineapple** has been recently introduced in the N. Kanara district, and the Kew and Queen varieties are becoming popular. They do well especially in the sandy soils of the coastal region. Some **Cashewnut** plantations are found in the N. Kanara and Belgaum districts. **Bananas** and **Jack fruit** are again common fruits of the wetter areas.

It is instructive to note that 70 to 75 percent of the cropped area is under food crops while 25 to 30 percent is under non-food crops. From the fore-going considerations the Bomay Karnataka may be divided into two main divisions; a western division and an eastern division. In the **western division** rice, sugarcane, betelnut, cocoanut, pepper, cardamum, fruits and vegetables are the chief crops. In the **eastern**

division *jola*, wheat, pulses, cotton and oil-seeds are the main crops. Each of these divisions can be sub-divided into two parts: the western division into the **Below-Ghat** and the **Above-Ghat** areas, and the eastern division into the **more favourable western part** and the **famine-effected eastern part.** Crops like chillies, tobacco and sugarcane are grown in the region where the two main divisions meet.

CHAPTER IX

Minerals

IT is unfortunate that, with the exception of building stone and manganese ore, the Bombay Karnataka is not very rich in economic minerals. **Manganese** ore occurs to some extent in the Dharwar, Belgaum and N. Kanara districts. It is the only economic mineral mined on a small scale near Tinaighat for export purposes. **Bauxite**, the ore for the manufacture of aluminium, is said to be available in the Belgaum district. **Iron ores** occur in various places, especially in the Basavarajadurg Island near Honavar, the Kappat Ranges and in a number of places in the Bijapur and Belgaum districts. Crude smelting was going on near Gokak, at Sidnal near Aihole in the Malaprabha valley, at Bisnal west of Bilgi in the Bijapur district, in an area between Manoli and Torgal on the Banks of the Malaprabha in the Belgaum district and in some places near Badami and Kaladgi, until very recent times, but the work has been discontinued on account of the increased cost of charcoal and availability of iron and steel goods at a cheaper price from Northern India, foreign countries and more recently from the Mysore State. **Gold** was mined in the Kappat Ranges as recently as about 30 years back but the mining has been stopped on account of the low gold content of

the ores. Today we find only derelict mines there. Alluvial gold-working has practically been discontinued. Both good and poor quality **kaolin**, a product of the disintegration of feldspar in the granites and gneisses, is found in the Khanapur taluka especially near Karalgi about four miles from Khanapur. It is also stated to occur in many other parts of the Bombay Karnataka. **White sandstone** of the Kaladgi Series is believed to be quite useful for glass-making. The beautiful temples at Aihole and Pattadakallu and the temples and caves at Badami are built of the Kaladgi sandstones. Large quantities of **limestone** belonging to the Kaladgi and the Bhima Series are found in the talukas of Bagalkot, Muddebihal and Badami; and these belonging to the Bhima Series are very beautiful building stones. Starting of cement industries has been advocated by some people. **Slates** and **flagstones** are quarried near Alnavar, Bagalkot and Kaladgi. The other minerals are clay for bricks and tiles (especially near Khanapur and Dharwar), sands, laterite, granites, gneissess, Trap rock, etc., all of which furnish building and road materials. Some of the well known buildings of Bijapur are built of Trap rock.

CHAPTER X

Other Industries

TABLE XII gives the percentages of people employed in the industries other than agriculture.

TABLE XII.

Percentages of the people employed in industries other than agriculture in 1931.*

District.	Industries.	Trade and Transport.	Professions and liberal arts and Miscellaneous.
Belgaum.	10·6	5·5	12·3
Bijapur.	13·0	5·2	10·7
Dharwar.	14·7	8·5	13·8
N. Kanara.	8·5	8·8	12·9

In the Bombay Presidency there is a general decrease in the number of people employed in these industries but the Bombay Karnataka has maintained the percentages it had in 1921.

Among the industries the **hand-loom** industry employs the largest number of people. Hand-loom industry turns out coarse and fine cotton piece goods, silk and artificial silk goods and coarse woollen cloths.

* Census of India 1931. Vol. VIII Part I. Bombay Presidency : General report; and Part II, Chapters on Occupations.

In the last case, both the spinning and weaving are done by the shepherd class; Bagalkot, Ranibennur and Sindgi are well known for coarse blankets. Among the places that have hand-loom industry those that are given in Table XIII are worthy of mention.

As the taste for the elaborate hand-woven cloths is gradually vanishing and as the ordinary hand-woven cloth cannot compete with the cheap and fashionable mill-made cloth the hand-loom industry is in a precarious state. With all the appeal on sentimental, national and religious grounds the hand-loom industry is declining day by day. However, " The hand-loom is even today regularly used for the production of most expensive and elaborate fabrics, e. g. ornamented cross-bordered *saries* from 60s to 100s counts and finest silks habitually worn by Hindu women at festivals and religious or marriage ceremonies. No attempt has yet been seriously made to produce such fabrics on power-looms in India and it is highly doubtful whether such an intricate process as the weaving of silk and gold-thread cloth can ever be profitably done by the aid of modern machinery worked by 'power'."* "If they (the weavers on hand-loom) would only study the changing demand of the

* Telang S. V. Report on Hand-loom Weaving Industry in the Bombay Presidency. Government of Bombay. 1933. pp. 3–5.

TABLE XIII.

The detailed information about hand-loom industry in some important places of the Bombay Karnataka. 1931.*

District & Place.	Number of Hand-looms.	Kind of cloth produced.	Daily production in value: Rs.
BELGAUM Dist.			
Belgaum.	275	*Saries*, *Khanas*, *Dhoties*.	800
Bailhongal.	406	*Dhoties* Cotton and Silk bordered *Saries*.	800
Pachhapur.	208	Plain Cotton bordered *Saries* and *Dhoties*.	500
Gokak.	725	Cotton and Silk figured *Saries*.	1,000
BIJAPUR Dist.			
Bagalkot.	350	*Khanas*, *Saries* & fine *Dhoties*.	2,500
Kamatgi.	800	Cotton mercerised bordered *Khanas*.	5,300
Ilkal.	3,025	Silk *Saries* with elaborate designs.	1,700
Guledgud.	3,500	Cotton and Silk *Khanas* & *Petas*.	10,300
Kerur.	1,100	—do—	1,500

* Census 1931 Vol. VIII. Part I. Bombay Presidency : General Report. p. 265.

TABLE XIII : Cont.

District & Place.	Number of Hand-looms.	Kind of cloth produced.	Daily production in value: Rs.
DHARWAR Dist.			
Gadag.	3,250	Silk bordered *Sarıes*, Pure Silk *Saries & Khanas.*	1,250
Gajendragad.	2,050	Silk bordered *Saries & Khanas.*	1,500
Hebsur.	262	*Gudars*, Coarse Cloth and *Durries.*	500
Ranibennur.	2,060	*Khanas* and Cotton bordered *Saries.*	1,250
Hubli.	3,512	*Khanas*, Pure Silk *Sarıes*, *Dhoties*, Scarves & *Pitambaras.*	2,000

middle and richer classes and adjust their industries to meet the requirements of the market the hand-loom industry would be a far more paying proposition than what it is at present. As it is the hand-loom weaver has to depend for the most part on the single and the unchanging demands of the country people."*

Hand-spinning was almost completely extinct a few years back; but in the last twenty years an attempt has been made to revive the hand-spinning

* Vide foot-note on page 88.

industry and a Karnataka branch of the All India Spinners' Association (Akhila Bharata Charakha Sangha) has been established at Hubli. The Bombay Government have given more than Rs. 20,000 in 1937–'38 in order to help and encourage **Khadi** production, make improvements in spinning methods, spinning and weaving implements, and to help the famine-stricken areas in the Bijapur district by inducing the people to take up hand-spinning. Table XIV gives the details of production in 1938.

It is seen that the total production of ***Khaddar*** in the Bombay Karnataka is small. The cloth is worn only by a small section of the public. It is true that the cult of the spinning-wheel has awakened the conscience of the general masses of India but the economics and practicability of ***Khaddar*** are still debated. ***Khaddar*** production is giving employment to a number of people. It is a question whether ***Khaddar*** will replace the mill cloth; but ***Khaddar*** production is definitely a very useful cottage industry.

Wool-weaving is a cottage industry carried on mostly by ***Kurubars*** or shepherds who produce ***Kamblies*** or coarse blankets. According to the census of 1931 there were 4,464, 3,507 and 1,282 workers in the Dharwar, Belgaum and Bijapur districts respectively. Medlery in the Dharwar

TABLE XIV.

Table giving detailed information about Hand-spinning and Hand-weaving Centres in the Bombay Karnataka in 1938.*

Centre.	Value of yarn. Rs.	Value of cloth. Rs.	Number of spinning machines.	Number of looms.	Remarks.
Gurlahosur.	9,564	35,343	412	138	Weaving more important.
Uppinbetgeri	11,455	34,022	1, 582	99	Both spinning & weaving. Coatings are important.
Hoskoti.	8,034	11,231	1,080	85	Spinning and weaving.
Kaladgi.	15,937	4,230	1, 252	39	More spinning.
Galagali.	6,861	7,619	660	23	Spinning and weaving.
Hudli.	6, 579	5,405	1,342	18	More spinnig.
Kembhavi.	2,851	5,259	577	43	More weaving.
Hosaritti.	—	—	388	56	Spinning and weaving.
Motebennur.	4,604	—	940	—	Only spinning.
Hungund.	3,321	—	979	—	—do—
Nargund.	—	—	833	—	—do—
Gulabal.	—	—	200	—	—do—

* Report of the Karnataka Branch of the Akhila Bharata Charakha Sangha. 1938. Old Hubli. pp. 10–11.

district has about 150 looms and, with the surrounding villages, produces 700 to 800 *Kamblies* a week.* The *Kamblies* are used by the cultivators who do not worry about roughness in view of their warmth and durability.

Industries of highly organised nature are those of cotton-ginning, cotton-pressing and oil-pressing. The former two are scattered all over the cotton-growing area and work only during the cotton season with the help of casual or local labour. There is a spinning mill in Gokak Falls and there are spinning and weaving mills in Hubli and Gadag. There are small hosiery mills in Hubli, Gadag and Belgaum (including Shahapur). Table XV gives the information about the factories and textile mills in the Bombay Karnataka.

Quite large numbers of people are employed in carpentry, smithy, brick and tile-making and pottery. These industries supply the local demands of the farmers. Articles of gold, silver, brass, copper, lacquer and glass are manufactured to a small extent in all the large places and especially in Hubli, Gadag and some places in the Belgaum and Bijapur districts. Leather industry is found in all the districts and employs 1,954, 1,618 and 1,570 in the Belgaum, Bijapur

* Report of the Bombay Economic and Industrial Survey Committee. 1938—1940. Vol. I. pp. 63-64.

TABLE XV.

Information about factories and textile mills: 1938. *

District.	Number of Factories.	Number of workers in factories.	Number of small power-loom factories.	Cotton Textile Industry.		
				No. of spindles.	No. of looms.	No. of workers.
Belgaum.	54	3,763	12	74,328	–	2,759
Bijapur.	51	1,722	?	–	–	–
Dharwar.	136	11,288	168	49,444	800	2,753
N. Kanara.	6	184	–	–	–	–
Total.	247	16,957	180	123,772	800	5,512

* Ibid. pp. 53, 56 and 57.

and Dharwar districts.[1] It is proposed to start a tobacco factory in Nipani. Industries connected with human food and drinks such as rice-pounding, flour-milling, bread-making, biscuit-making, grain-parching, oil-pressing, *gul*-boiling, sweets-making, fruit-canning, bottling aerated water, etc., give employment to some people. Another industry worth mentioning is the building industry. There are other minor industries like *bidi*-making, basket-making, tanning, tailoring, laundrying, etc. Nipani is famous for *bidis* and other tobacco products; there are two large manufactures one of which employs 125 and the other 135 workers and turn out an output of the total annual value of Rs. 500,000 and Rs. 600,000 respectively.[2] In the N. Kanara district wood-cutting, ship-building and repairing, wood and ivory-carving, fishing and fish curing are industries of some importance. Salt is dried from sea water on a large scale in Sanikatta near Gokarn and the annual production is about 300,000 maunds of 80 lb. each. (Plate III. b.). Salt is allowed to be dried from sea water, after the Gandhi-Irwin pact, by local people, under licence for sale and for local use. Such salt is duty-free and should not go outside a radius of

1 Report of the Bombay Economic and Industrial Survey Committee, 1938-1940. Vol. I. p. 67.

2 Ibid. pp. 76 & 77.

five miles from the locality where it is manufactured. This is mainly intended to help the poorer people who cannot afford to pay for the costlier taxed-salt. This is a favour shown to the coastal people while the residents in the interior have to pay a duty of Rs. 1—9—0 per maund. Salt is given to the fish curers at a concession rate of Re. 1/- per maund. Fish industry employed 6,507 people in 1931 and there are 14 fish curing yards in the N. Kanara district.* Provision dealers, commission agents, cloth merchants, stationery and general store keepers and restaurant keepers form the bulk of those that are engaged in trade.

There is much unemployment in the Bombay Karnataka. The cultivators are almost without work from five to seven months in the off-season of the year. In this connection a resolution passed by the Bombay Economic and Industrial Survey Committee may be quoted : " Looking to the extent of part-time unemployment prevalent amongst the agricultural classses and to the need for increasing the cultivator's income, the committee feels that the industrial policy of the provincial Government should be such as to promote part-time occupations for the cultivators

* Report of the Bombay Economic and Industrial Survey Committee, 1938-1940. Vol. I. pp. 90 & 91.

PLATE III. a.

(Photo by B. S. Sheshgiri)

Betelnut Garden near Sirsi, N. Kanara district, situated in Deep Valley and surrounded by Evergreen Forest.

PLATE III. b.

(Photo by B. S. Sheshgi

Salt Pans, and Salt Heaps in the Customs Yard, at Sanikatta near Gokarn, N. Kanara district.

and agricultural labourers. With this end in view the committee feels that all possible steps should be taken to promote industries like hand-spinning, rice-husking, basket-making, rope-making, etc. The committee also feels that the road programme of the Province — both extension of roads and the maintenance of the same—should be so timed and regulated as to afford part-time employment to the agricultural classes. Another useful way of dealing with this problem is to encourage industries ancillary to agriculture such as dairying, poultry-keeping, bee-keeping etc. It is, however, necessary to make it clear that the committee is at the same time of the opinion that every thing should be done for the industrial development of the Province on all fronts; and methods other than the cottage method should also be encouraged especially for the production of articles which the villagers cannot produce by their spare time occupations." * Hand-spinning has been recommended as the ideal part-time cottage industry as it involves very little capital, is easy to learn and can be taken up and left at any time. It is also of prime importance to start some industrial research laboratories and Government should insist on every large concern to have a laboratory attached to it.

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* Report of the Bombay Economic and Industrial Survey Committee. 1938—1940. Vol. I. p. 151.

Difficulties of Cottage Industries.

In the first place, on account of the competition of the large producers and also due to the lack of financial resources the cottage workers do not get an adequate supply of good raw materials for their industries; many a time they have to pay a high price for the raw materials. Some merchants insist that the buyers of raw materials should dispose of the finished products through them only. In some cases the raw materials are of either unreliable or poor quality. Thus the small producers have to encounter the difficulty of getting adequate supplies of raw materials and have to be content with what remains after the requirements of the export dealer and the large manufacturers are satisfied. Secondly, most of the existing implements are inefficient and out of date; still the artisan works on them because, not only does he lack the financial resources to buy improved implements but also there may not be any market for his increased output. Above all, the marketing difficulties constitute the fundamental problems. At present as there are not many co-operative organisations selling the cottage products, the artisan has to sell his products to his *karkhandar* or a local merchant or by himself at a fair or market. The difficulties of selling are more because

the cottage-products cannot stand comparison with the factory products as to the quality or finish or cheapness or appeal to the modern taste.

The **small scale industries** are better organised and have the benefit of the keen enthusiasm of their owners. Yet they too have to encounter a number of difficulties as regards raw materials, finance, technical assistance and advice, competition with the imported materials and products of foreign concerns in India, marketing, etc., and therefore, they have not made much headway in their progress.

Industrial Prospects of the Bombay Karnataka

The Government of Bombay has carried out surveys on Vegetable Oil Industry (1920–21), China Clay Deposits in Khanapur Taluka (1920–21), Indegenous Wood for Match Making (1922), Arts and Crafts (1926-27), Hand-loom Weaving (1927–28), Village Tanning (1927-28), Marine Fisheries (1930–32) and Possibilities of Aluminium (1936). Many improvements have been introduced by the Department of Industries such as the fly-shuttle loom, hand-driven machinery, sizing machines, dobbies, designs of new bangle furnaces (Godgeri and Tallur), improved spinning wheels, etc. In addition, the Department gives education, holds demonstrations, carries on propaganda, gives scholarships and other kinds of

assistance in order to promote industrial development. The Department has started Industrial Co-operative Associations to facilitate buying of raw materials and selling of finished goods. There are three Industrial Co-operative Associations viz. one at Hubli, a second at Kamatgi and a third at Belgaum. The last one was started very recently. The Hubli Association which was the earliest to be started is doing very useful work as could be seen from the membership of 240 and a total sale of Rs. 22,852-12-0 in 1938-39. Loans and concessions are also given to private firms and to individuals in order to manufacture chemicals, paper, ply-wood, lamps using vegetable oils, etc. Financial help is also given to the All India Spinners' Association and the All India Village Industries Association. In spite of all that has been done by the Provincial Government one finds support for the public feeling that the State Policy towards the development of Industries in the Bombay Karnataka has been largely one of ***laissez faire.***

Of all the industries those that are connected with the forest products stand out to be very promising. The general features of the forests in the western parts of the Bombay Karnataka have been already discussed. Today timber is the only important forest product exploited commercially and that too from the accessible areas situated near centres of

demand and means of communications. Timber is very expensive to transport and it should, therefore, be processed, as far as possible, in the forest itself. This requires the establishment of saw mills in the heart of forests. **Pulp** for paper and rayon is another promising industry. The large bamboo thickets can profitably be utilised for this purpose and the cleared space planted with suitable economic timber plantations. Soft woods like *savar*, *karkad*, *pangara* and *kuda* can be used for the manufacture of **Matches** and toys. **Gums, tenning materials, grass,** etc., offer considerable scope for establishing industrial concerns.

Fruit-canning and manufacture of **fruit products** have great potentialities as large quantities of fruits are grown in the Bombay Karnataka and most of these fruits are seasonal. Canning of mango and pineapple, bottling of juices and syrups of citrus and other fruits, jams and jellies, and drying of fruit have been suggested.

More attention should be paid to the **utilisation of wastes.** Rice husk and groundnut shell can be used for the manufacture of paper. Fibre can be extracted from linseed stalk.

The geology of the Bombay Karnataka is not very thoroughly studied. It is, therefore, risky to

prophesy about the mineralogical and metallurgical industries. The **iron smelting** industry may be revived under protection at least for the time being. Similarly bauxite and manganese ore exploitation may be taken up more seriously. It is said that large quantities of limestone exist in the Kaladgi and Bhima Series and they may be utilised for the manufacture of cement. Large out-crops of granites and allied rocks containing very well developed mineral crystals occur in many places especially in the Khanapur taluka and near Gajendragad and Bilgi- Granites take a very good polish and the polished stones can be sold profitably in large centres for building and ornamental purposes. In this connection the occurence of marble-like limestone in the Bagalkot and Muddebihal talukas may be mentioned. Unfortunately coal is not found in the Bombay Karnataka, but any amount of water power is available to manufacture ' white coal ' .

There are many who do not believe in the economy of hand-spinning. When leaders appeal some people buy hand-spun and hand-woven cloths but again go in for mill cloth in a few days. The mill textile industry on the other hand is on firmer grounds. India can manufacture all her cotton textile requirements of decent quality only if the Government encourages this industry on a truly nationalistic basis.

It does not require any great effort to prove that there is a tremendous development of the Indian mill-cloth-industry in the last twenty years. The eastern part of the Bombay Karnataka produces excellent cotton and more mills can be started. The manufacture of rayon from wood pulp is an additional prospect for these mills.

A number of people believe that the industrialisation of the country leads to more unemployment. Mass industrialisation may lead to that. Those small industries which are working on fairly sound economic lines should be left to go on smoothly, or helped to develop in their own already organised ways. The industries suggested above are almost new ones to the Bombay Karnataka and therefore instead of increasing unemployment they may help to reduce it.

CHAPTER XI

Irrigation

IRRIGATION is found to some extent in all parts of the Bombay Karnataka but large irrigation works are found only on the Ghataprabha near the Gokak Road station and on the Dharma in the Hangal taluka. Ponds (tanks) supplying water for irrigation are also many, and the following viz., the Gadikeri Tank near Mukutkhan Hubli, Sangogi Tank in the Indi taluka, Hullur Tank in the Bagewadi-Muddebihal talukas, Muchkundi Tank in the Bagalkot taluka, Madag Tank (irrigation only) in the Kod taluka, Asundi Tank and Medlery Tank in the Ranibennur taluka, Dambal Tank in the Gadag taluka and Mavinkop Tank in the Dharwar taluka, are worthy of mention. Well-irrigation is common everywhere. Table XVI gives the details for the year 1937–38. The district statistics are given in Appendix E and the information about irrigation works for which the capital and revenue accounts are kept is given in Appendix F.

It is evident from Table XVI that 210,494 acres or 2·6% of the total cultivated land is under irrigation. Dharwar district comes first, Belgaum second, Bijapur third and N. Kanara last; but if percentages of

TABLE XVI

The irrigation statistics of the Bombay Karnataka: 1937-38.*

CROP.	IRRIGATED BY					
	Government canals.	Private canals.	Wells.	Tanks.	Other sources.	Total.
Rice.	8,807	3,755	953	77,888	23,960	115,363
Wheat.	-	63	1,207	106	52	1,428
Barley.	198	18	4,716	12	1	4,945
Jowari.	3	68	13,436	34	7	13,548
Bajri.	-	-	27	-	-	27
Maize	2,322	143	7,143	-	135	9,743
Other cereals & pulses.	3,545	230	5,158	603	275	9,811
Sugarcane.	492	782	11,279	1,950	2,112	16,615
Other food crops.	1,237	169	20,111	528	475	22,520
Cotton	1,178	24	5,381	-	8	6,591
Other non-food crops.	1,641	266	17,410	530	193	20,040
Total area under irrigation.	19,423	5,518	86,821	81,651	27,218	220,631
Area irrigated more than once.	957	125	8,631	276	148	10,137
Net area irrigated.	18,466	5,393	78,190	81,375	27,070	210,494

* Season and Crop Report of the Bombay Province for the 1937-38: Government Central Press, Bombay. 1939 pp. 74-81.

irrigated areas are considered N. Kanara comes first with 8·7%, Dharwar second with 3·3%, Belgaum third with 2·9% and Bijapur last with 1·2%. Sugarcane, rice and maize are the main irrigated crops in the Belgaum district; *jola*, barley and cotton in the Bijapur district and mainly rice in the Dharwar and N. Kanara districts.

Irrigation by Government canals: Over 18,000 acres are irrigated by this means and nearly half this number are under rice. Maize and cotton are the other individual crops. The Dharma canal supplies water to irrigate mostly rice and a small amount of sugarcane. The Dhupdal Reservoir on the Ghataprabha was completed in the year 1896-97 and supplies water for a large number of crops of which maize, cotton and sugarcane are the main ones. It also supplies water to the M. & S. M. Ry. Company at their Hukeri Road station and to the electricity generating station at the Gokak Falls. This power is used to run the Gokak Spinning Mills. In 1916 the Bombay Government had a project to extend the storage on the Ghataprabha, called the Gokak Storage and Canal Extension Project, which was estimated to cost Rs. 20,000,000; but the project was dropped in 1926. Two more projects are under investigation, namely the Asoga Scheme in the Malaprabha valley near Khanapur and a Pick-up

Weir across the Malaprabha near Shivayogamandira in the Badami taluka.

Irrigation by Private Canals:- The total area under this system is about 5,500 acres. Nearly two-thirds of this are found in the N. Kanara district and the remaining third in the Belgaum district. Private canals in the Belgaum district irrigate a number of crops while in the N. Kanara district they are used to irrigate mostly rice and a small area of sugarcane.

Well Irrigation:- *Wells are the greatest sources of irrigation water and nearly 87,000 acres are annually irrigated by this means. A large acreage of vegetables is watered by this source. It is very common

* Number of wells and irrigated area per well in the Bombay Karnataka.

District.	Masonry wells.	Non-Masonry wells.	Total No. of wells.	Area per well in acres.
Belgaum.	3,037	15,974	19,011	2·1
Bijapur.	2,693	8,382	11,075	3·3
Dharwar.	1,974	2,780	4,754	0·2
N. Kanara.	5,417	11,617	17,034	0·1

(Source:— The Season and Crop Report of the Bombay Province for the year 1937-38. pp. 88-89.)

to find a few small gardens round almost every settlement, large or small, growing various kinds of vegetables. The other important crops that use well-water are *Jola*, sugarcane, maize, cotton and barley. Well-irrigation is very common in the Belgaum and Bijapur districts. The talukas of Belgaum, Chikodi, Hukeri, Athni, Gokak, Indi, Bagewadi, Sindgi and Bijapur have a large number of wells. In the N. Kanara district the number of irrigation wells is great but the irrigated area per well is very small.* The Bijapur district has the highest irrigated acreage per well.

Tank Irrigtion:— This system is as important as well-irrigation and has a total of about 82,000 acres, made up as follows: the district of Dharwar has 52,000 acres, N. Kanara 18,000 acres, Belgaum 11,000 acres and Bijapur 1,000 acres. 78,000 acres are under rice and about 2,000 acres are under sugarcane, so that these two crops monopolise almost the whole of the tank-water. All the tanks depend upon rainfall and the supply of water is uncertain especially in the east. The Madag Tank has a Ghat and forest catchment area and the supply is more certain. A large number of the tanks have become or are being silted up. Once they are devoid of water they are used as agricultural land. The

* Vide footnote on page 107.

amount of land thus recovered is far less in value as compared to the benefit derived by impounding water in the space and using the water for irrigating the nearby land. Such tanks may profitably be reconstructed once again.

Thus it is seen that wherever water is available from whatever source cultivators use it for irrigation. In some suitable areas two or even three crops are taken on the same land in one year. About 10,000 acres are thus cropped more than once every year. Water is the prime need in this part, and also in the whole of India, on account of the uneven distribution of rainfall. With water at their command cultivators can grow paying crops and can be sure of obtaining a decent profit. It is very desirable to give more attention to this problem in any future scheme of national planning. Dried-up tanks may be deepened; new and temporary tanks may be constructed for supplying irrigation water and when the water dries up in the dry season the lake-beds may be used for growing winter crops. Similarly well-sinking and construction of large and small reservoirs may be taken up gradually. Such work is bound to be slow but the results will surely be salutary and the country as a whole will be greatly benefitted.

CHAPTER XII

Animals

ANIMALS occupy an important place in the agricultural economy and it is not improper to discuss this section in greater details. Table XVII gives a summary of the animal statistics in the year 1934-35.

Cattle:-- His Excellency Lord Linlithgow has made a pregnant remark viz. "The cow and the working bullock carry on their patient backs the whole structure of Indian agriculture." Amongst the animals cattle are the most important from the point of view of agriculture. Bullocks and he-buffaloes are the chief power animals while she-buffaloes and cows are the chief milch animals.

The districts of Dharwar, Belgaum and Bijapur have each nearly a million cattle while N. Kanara has just over a quarter of a million. As there is a good deal of difference in the cropped areas of these districts a better figure is one which expresses a relation between the number of cattle and the total cropped area, or the number of acres per pair of work cattle. Figures for the latter are given in Table XVII and it is found that N. Kanara has 4 acres per pair of work cattle, the Beglaum district 19, the Dharwar district 22 and the Bijapur district 37. Within the

TABLE XVII.

Statistics of the animals in the Bombay Karnataka:1934-35.*

Animals.	Belgaum district.	Bijapur district.	Dharwar district.	N. Kanara district.	Total.
Cattle (a+b+c).	604,880	505,246	608,458	271,405	1,989,989
Work animals: Bullocks.	159,333	150,417	184,215	76,735	570,700
" " Cows.	5,060	1,993	6,597	1,582	15,332
" " Buffalo-Bullocks	25,513	3,662	6,882	30,327	66,384
" " Buffalo-cows.	7,527	1,888	10,486	578	20,479
" " Total. (a)	197,433	157,960	208,280	109,222	672,895
Milk animals: Cows	76,644	86,443	97,136	62.510	322,733
" " Buffaloes.	110,547	67,466	86,813	23,938	288,764
" " Total. (b)	187,191	153,909	183,949	86,448	611,497
Other cattle. (c)	220,256	193,377	216,229	75,735	705,597

* Season and Crop Report of the Bombay Presidency for the year 1934—35. Bombay, 1936. pp. 108-131.

TABLE XVII: Animals Statistics: (Cont.)

Animals.	Belgaum district.	Bijapur district.	Dharwar district.	N. Kanara district.	Total.
Cattle. (a+b+c)	604,880	505,246	608,458	271,405	1,989,989
Sheep.	213,750	167,432	84,341	588	466,111
Goats.	111,140	212,631	101,012	2,596	427,379
Horses and Ponies.	4,322	7,166	3,063	87	14,638
Mules.	4	21	6	—	31
Donkeys.	2,792	4,406	4,257	105	11,560
Camels.	140	34	111	1	286
Cropped area in acres per pair of work animals.	19·1	36·6	21·6	4·2	

districts the wet areas have a small acreage per pair. The reverse is the case in the dry areas.

Work Cattle: Bullocks and he-buffaloes form the bulk of the work cattle. Bullocks are found in all places while he-buffaloes are important in the wet areas where they can work in mud and continuous rain without any bad effect on their constitution. The proportion of he-buffaloes to bullocks is 1 : 2·5 in N. Kanara, 1 : 5 in the Belgaum district, 1 : 11 in the Dharwar district and 1 : 27 in the Bijapur district.

Milch Cattle: Cows and she-buffaloes are the main milch cattle. Cows outnumber the buffaloes everywhere except in the Belgaum district where the buffaloes take the first place. Buffaloes give high-quality milk and the yield of milk per animal is greater than that of a cow; buffaloes, therefore, are preferable and are kept in large numbers by professional milkmen. Cow, though yielding a smaller quantity of milk, serves a second and important purpose of supplying work animals.

There is practically no rearing of animals for beef. Old animals are seldom sold to a butcher due to religious feelings; they are allowed to die a natural death. In many cases old animals are not given enough food and therefore even the hides of such animals are not of good quality. Some

religious-minded philanthrophists donate money to cow-houses (Goshalas) but the number of such institutions is very small. Buffalo-meat is not generally eaten. Meat of old cow is tough and tasteless.

In the Belgaum district people prefer bullocks imported from Mysore and Kathaiwar. In the Bijapur district although the local Krishna Valley breed is excellent a number of animals are imported from Mysore, Bellary and Madras. In the Dharwar district people prefer to buy young stock and rear them on the upland pastures of the Dharwar, Karajgi, Ranibennur, Bankapur aud Gadag talukas. Adult animals are also imported. Bullocks of local breeding form a good proportion of the cattle. Most of the buffaloes on the other hand are bred locally by the farmers and professional milkmen and the stock is usually of a very high standard. There are three breeds of cows in the Bombay Karnataka viz., Amrit Mahal, Khillari and Krishna Valley. Recently Gir cows and bulls have been brought from Kathaiwar, to the area where the Krishna Valley breed is found, in order to test the possibilities of introducing the Gir breed in place of the Krishna Valley as a superior milch and draught animal.

Sheep:—Sheep are the animals of the dry areas and are, therefore, found in the eastern talukas of the Belgaum district viz., Chikodi, Athni, Gokak and

Parasgad, all over the Bijapur distsict and and in the Ranibennur, Gadag, Karajgi and Navalgund talukas of the Dharwar district. The Bijapur district has the highest number (167,000) while N. Kanara has only about a thousand. They are bred by professional shepherds and supply milk, mutton, wool and hides. There is no organised breeding of sheep in the Bombay Karnataka. The possibilities of improving the quality of mutton and wool of our sheep deserve experimentation. The animals are grazed on rough grass, small twigs and bushes and manure the soil if they are folded on empty fields. Sheep manure is considered to be of a very good quality.

Goats:— Goats are also animals of dry climate and therefore are found in great numbers in the eastern part of the Bombay Karnataka. It is a common thing to find a small number of goats in a flock of sheep. Bijapur district has the largest number. Goats supply milk, meat and hides. Goat-milk is not liked by many.

Poultry:—Poultry-keeping, though very common and old, is a neglected industry in the Bombay Karnataka. The Agricultural Department are trying to introduce breeds like White Leghorn and Red Rhode Island which lay a greater number of eggs per year than the local birds.

Improvement of Live-stock:— It is unfortunate that the farmers and shepherds have not understood the importance of pedigree animals which may be successfully used to grade the local animals. The improvement of animals by grading is a long process and requires a sustained effort on the part of the farmers. It may require twenty years or more to obtain a herd of graded animals. However the problem is worth tackling as the results are almost always satisfactory.

Improvement of grassland and better utilisation of waste and surplus land for fodder production are also necessary for the improvement of live-stock. Controlled grazing is of prime importance and in this connection a resolution (Resolution 2. b. Subject 2.) passed by the Cattle Conference held at Simla in May 1937 may be mentioned: " That great improvement in existing grassland is possible by controlling the periods during which individual areas are open to grazing and by limiting the number and species admitted. Without such control deterioration is progressive and frequently the poorest cattle are found where grazing is unrestricted."* ".....it is evidently agreed that as far as cattle are concerned, the only sound policy for the plains of India is to improve the best indigenous breeds, by systematic selection

* Proceedings of the Cattle Conference, Simla: May 1937. p. 78.

and proper feeding and management, since European breeds have proved generally unable, even under the best conditions, to maintain themselves satisfactorily within the tropics."[1] The Agricultural Department has two cattle stations in the Bombay Karnataka viz., at Bankapur and Tegur. Pedigree bulls are raised in these stations and sold to villagers or village institutions at a concession rate. The institution or some person in the village is made to look after the animal for which the Government pays a small sum. Such a scheme is a splendid beginning if it is carried out on a scientific basis. Today a large number of mongrel bulls ('scrub' bulls) are allowed to wander about freely and they serve the cows usually when the latter are out for grazing. Unless the Live-stock Improvement Act of 1933 forces the castration of all unwanted bulls real improvement of animals on a large scale is impossible. Col. Sir Arthur Olver says: "....the systematic castration of inferior males before they can perpetuate the species, is obviously one of the most potent factors in any programme of live-stock improvement. It is in fact now generally recommended that provincial or state legislation should be undertaken for the compulsory castration in selected areas."[2]

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1 Proceedings of the Cattle Conference, Simla. May 1937. p. 98.

2 Ibid. p. 102.

It is true that there are not enough pedigree bulls to satisfy the demand, but for the time being at least, local bulls selected by experts together with the pedigree bulls supplied by the breeding stations should form a starting nucleus. The whole idea is to tackle the problem from the bottom on a sound scientific basis. The same system can be applied, with modifications, to the improvement of sheep and goats. The problem is easier here because these animals are kept in flocks. In the case of the buffalo local milkmen take good care in the selection of bulls; mongrel bulls are almost entirely absent. Purity of the breed and milk-yielding capacity are easily maintained. A few of the nomadic cow-breeders also take great care in the selection of bulls and purity of the breed is thus kept up.

CHAPTER XIII

Means of Communications

ROADS, railways, water-ways and air-ways are the chief means of communications. They have been very useful for bringing into contact the peoples of the different places, for developing trade and commerce and for widening the vision of the public.

Roads:— Road-construction is taken up mainly by three bodies, viz., the Public Works Department of the Government of Bombay, the District Local Boards and the Municipalities. The P. W. Department constructs and maintains all the first class roads and a large number of feeder roads; the District Local Boards have in their charge by-roads and feeder roads; and the Municipalities confine themselves to the construction and maintenance of roads only in their respective jurisdictions. In the Bombay Karnataka the main road is a part of the Poona-Bangalore road which enters this area a few miles south of Kagal and runs for nearly 195 miles in a general S.S.E. direction. The road serves the large towns of Nipani, Sankeswar, Belgaum, Dharwar, Hubli, Haveri and Ranibennur. (Fig. 16). A number of smaller, but metalled, roads bifurcate from the main road and radiate from the large towns. For

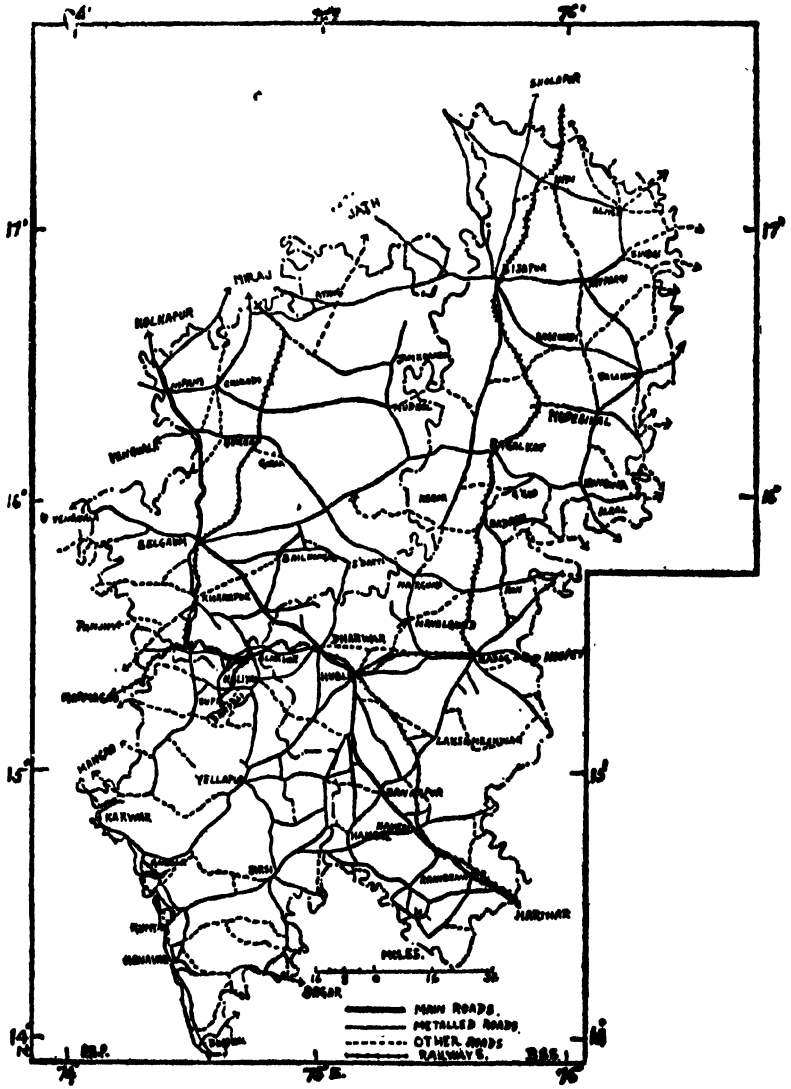


Fig. 16.

The important MEANS OF COMMUNICATIONS in the Bombay Karnataka.

instance from Belgaum a road goes to Bagalkot on the east, to Dharwar on the southeast, bifurcating at Bagewadi to go to Bailhongal and Saundatti, to Khanapur, Londa and Supa on the south and to Savantwadi and Vengurla on the west. The last road deserves special mention. It is a direct road, of about 78 miles, across the Western Ghats. If the harbour of Vengurla is developed Vengurla can have the entire northern part of the Karnataka as its hinterland. It is true that Marmagao serves this area but the port lies in a foreign territory and the goods have to pay customs duties and pass through customs barrier. More-over there is no good road to Marmagao.

In addition to the radiation of the roads from the large towns on the main road there are other important nodes from which good roads radiate. Among such towns Gadag, Bagalkot and Bijapur may be mentioned. From Gadag roads go to Hubli on the west,to Navalgund on the north,to Gajendragad on the northeast and Mulgund, Lakshmeshwar and Bankapur on the southwest.

Besides the metalled roads there are third class or unmetalled roads and tracks which connect villages to nearby towns. Finally there are foot-paths and donkey-paths used by pack animals and pedestrians.

The metalled roads carry the largest amount of traffic. The feeder roads were formerly intended to serve the railway lines; but owing to the introduction of passenger buses and goods lorries there is a keen competition between the road and the railway traffics and consequently the Railway Company are compelled to introduce competitive fares in order to attract traffic. Today public buses run on almost every road connecting not only places far away from the railway but also those that are served by the railway. There is sufficient road traffic because the services are frequent and the total railway milage is not adequate. More-over the placing of the railway lines is not always quite suitable. For instance the line from Belgaum to Dharwar first goes south to Londa and then eastwards to Dharwar. It passes through comparatively sparsely populated area and the most protected area of the two districts from the point of view of famine. The railway distance is 75 miles while the direct road is only 48 miles and passes through large villages like Mukutkhan Hubli and Kittur. Again there is no east to west line connecting important places in the districts of Belgaum and Bijapur. The railway distance from Belgaum to Bagalkot is 182 miles and the line goes south to Londa, east to Gadag and back north to Bagalkot. The minimum travelling time by the railway is between seven and

eight hours. The road distance is 87 miles and one can do the journey comfortably in four to five hours. The fare also is cheaper by road. It is true that the railway journey is more pleasant than the road journey but does this comfort compensate for the additional expenditure and the loss of time? There is one big disadvantage in the case of the present road systems. Except in a few cases roads have no bridges across rivers and a few have only causeways. Such roads are, therefore, motorable only in fair weather.

The traffic on the cart track is not inconsiderable. It is with the help of these tracks that cultivators bring agricultural products to market places. They, therefore, serve an important purpose in the national economy though the distances are small.

On the whole the road net is fairly good except in N. Kanara. Some more roads and many bridges and causeways are still necessary e.g. a road connecting Athni to Gokak and causeways or bridges across the Bhima and the Krishna to facilitate easy and all the year communication between the Bijapur, Sholapur and Dharwar districts.

Railways:— The Madras and Southern Mahratta Railway Company serves the whole of the Bombay Karnataka. There are single metre-gauge lines of a total distance of just over 500 miles made up as

shown in table XVIII. All the lines except the branch to Dandeli were opened between 1884 and 1887 and the Dandeli branch was opened in 1919.

TABLE XVIII.

The Railway Milage in the Bombay Karnataka.

District.	Line.	Milage.	Total Milage.
Belgaum.	Shedbal to Alnavar.	127	
	Londa to border of N. Kanara.	5	132
Bijapur.	Alur to Bhima River.	127	127
Dharwar.	Alnavar to R. Tungabhadra.	117	
	Hubli to border of Raichur District.	53	
	Gadag to Alur.	29	199
N. Kanara.	Londa-Marmagao Line	25	
	Alnavar to Dandeli.	20	45
	Total.		503

There are two main lines; one is a part of the Poona-Harihar section and traverses this area from Shedbal to River Tungabhadra first in a N.N.E. to S.S.W. direction from Shedbal to Belgaum, north to scuth from Belgaum to Londa, west to east from Londa to Dharwar and northwest to southeast from

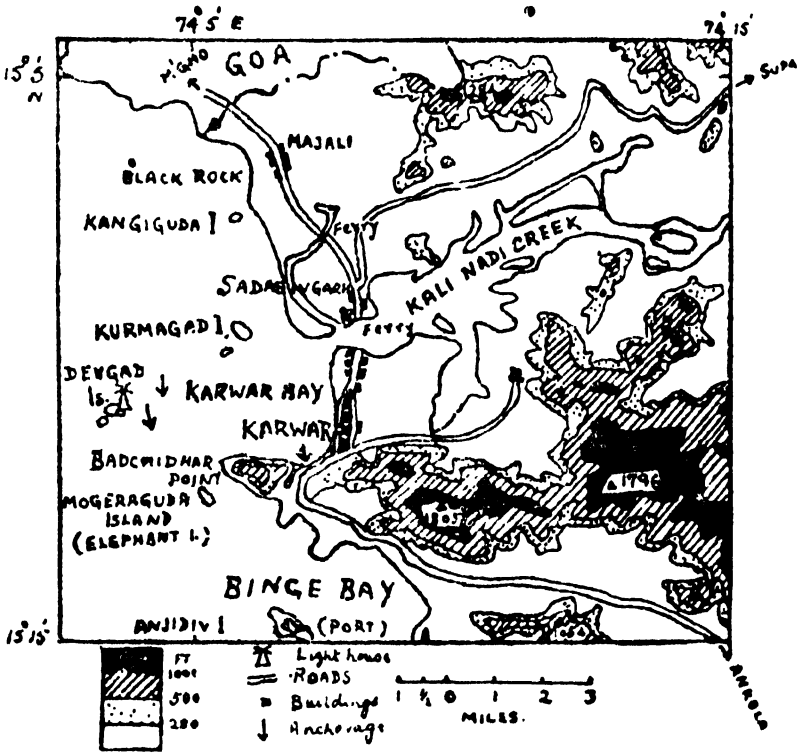


Fig. 17.

The approach to Karwar, Karwar Bay and Karwar harbour.

Dharwar to River Tungabhadra; the other line is a part of the Marmagao-Masulipatam section and traverses the Bombay Karnataka from near Dudhsagar to beyond Harlapur. The portion between Londa and Hubli is common to both the main lines. A branch line runs from Alnavar to Dandeli and is used mostly for timber traffic. There is another

branch line from Gadag to Sholapur and serves Bagalkot and Bijapur.

This cannot be called a railway net-work and, as has already been discussed, a direct line from Gokak or Belgaum to Dharwar is necessary. There is not even one good port serving the southern part of the Bombay Karnataka. A railway line from Hubli to Karwar and the development of Karwar harbour have been suggested. The Karwar harbour in the Karwar Bay is protected from the southwesterly winds by the Badchidhar Point and is comparatively free from silt as it is fairly away from the Kalinadi mouth (Fig. 17.). The harbour is not deep and requires extensive dredging if ocean-going steamships are to come to the quayside. At the present time the roadstead for large steamers is near the Light House on the Devgad Island, about four miles west of the harbour. The Mysore State Railway Company are thinking of extending their line from Sagar to Bhatkal and developing the Bhatkal harbour. Bhatkal has a protected harbour and though small it is the deepest natural harbour of N. Kanara. (Plate IV. b.). The other harbours are those of Honavar, Kumta, Sanikatta and small ones in the Belekere Bay. Before the Railway construction Kumta was a well known port serving the needs of the southern part of the Bombay Karnataka; now it has

lost its former importance. The building of the Western India Portugese Railway and the development of the Marmagao harbour on the one hand and the construction of the railway to Bombay on the other hand have completely ruined Kumta and the other N. Kanara ports by diverting the goods traffic to the north. The building of a railway from Hubli to Karwar is expected to improve matters to some extent. Electric power produced at the various water-falls on the west-flowing rivers will be quite handy to work the railways. The values of import and export trades in the N. Kanara ports during the year 1936–37 are given in table XIX.

TABLE XIX.

Details of the values of Imports and Exports in the N. Kanara Ports during 1936–37.*

Port.	Rupees in Lakhs.	
	Imports	Exports
Karwar.	10·0	6·1
Sanikatta.	9·2	11·0
Honavar.	16·8	11·5
Bhatkal.	4·2	0·2

* Report of the Bombay Economic and Industrial Survey Committee 1938–40. Vol. I. Bombay. 1940. p. 4.

It is seen that the port of Honavar has the largest amount of trade. The export products consist of timber, fish, salt, spices and other agricultural goods.

Thus if all the suggested railway lines are constructed and the ports developed, the Bomby Karnataka will have a fairly good net-work of the means of communications. Such a net-work may act as an incentive to the industrialisation of the area and also as protection against the ravages of famines.

River traffic is practically absent except in N. Kanara where passengers and goods are carried in small sail and rowing boats along rivers and creeks. There are coastal steamer services between Bombay and Karwar and are closed in the monsoon months between June and September. There is at present no aeroplane service in the Bombay Karnataka. A scheme to start a passenger and mail aeroplane service between Bangalore and Bombay is under consideration. In that case Belgaum is likely to become a landing place.

CHAPTER XIV

Population

THE Bombay Karnataka has about three and a half million people of whom about 1·1 million are found in each of the Belgaum and Dharwar districts, 0·9 million in the Bijapur district and 0·4 million in the N. Kanara district. Table XX gives the population statistics of the Bombay Karnataka in the year 1931. The taluka figures are given in Appendix G.

The density is the lowest in N. Kanara (106 per sq. mile) and the highest in the Belgaum and Dharwar districts (239 and 233 per sq. mile respectively). The Bijapur district has a density intermediate between the above figures (152 per sq. mile). The smaller densities in the N. Kanara and Bijapur districts are due to entirely different reasons. In N. Kanara rain is quite sufficient, but a good deal of the district is unhealthy, hilly and covered with forests. There are in addition ravages of wild pigs and other animals. People live in port towns, on the coastal plain, on river terraces, in valleys and forest clearings. The occupied area, therefore, is very small. The coastal talukas of Karwar, Kumta, Honavar, Bhatkal (Peta) and Ankola and the inland talukas of Sirsi and Siddapur, situated on the even plateau

TABLE XX.

The Population Statistics of the Bombay Karnataka in the year 1931 grouped according to religions.*

Item.	Belgaum district.	Bijapur district.	Dharwar district.	North Kanara district.	Total.
Population in 1931.	1,076,701	869,220	1,102,677	417,835	3,466,433
" " 1921.	952,996	796, 876	1,036,924	411, 727	3,188,523
%age variation 1921—31.	+13·0	+9·1	+6·3	+4·0	+8 4
Area in square miles.	4,612	5,710	4,606	3,946	18,874
Density per sq. mile.	233	152	239	106	184
Hindus.	927,723	758,231	924,565	368,388	2,979,907
	86·1%	87·3%	83·9%	88·2%	86·0%
Muslims.	93,224	105,499	158,431	30,637	387,791
	8·7%	12·1%	14·4%	7·3%	11·2%
Jains.	47,660	3, 169	10,716	1,093	62,638
	4·4%	0·4%	1·0%	0·2%	1·8%
Christains.	7, 887	1,261	8,409	17,704	35,261
	0·7%	0· 1%	0·8%	4·2%	1·0%
Others.	207	60	556	13	836

* Census of India 1931, Vol. VIII part II. Statistical Tables. 1933. pp. 8 and 404—410.

surface, have greater densities of population than the talukas of Haliyal, Yellapur, Supa (Peta) and Mundgod (Peta) which have very small densities. In the Bijapur district the aridity of climate, the uncertainty of rainfall and poverty of soil due to soil erosion are the chief causes for the small density of population. A family and a pair of bullocks can cultivate as much as nearly 40 acres. Land covered by forests or rough grass is very small. The population is evenly distributed in the district except in the hilly strips in the south where the popultion is sparse. In the Belgaum district conditions for settlement are favourable in general. The western part of the district is hilly and forested, and the density is small; in the east in the area adjoining the Bijapur district the climate is not so favourable and here too the density is small; in the middle, in a north-south strip, the living conditions are very good and the country is very thickly populated. In the Dharwar district the western part has a greater density than the eastern part mainly on account of the favourable climate in the west. The map in Figure 18 gives an idea of the distribution of the population. In this map the spheres represent towns having a population of 10,000 or more.

Religions:— Hindus form more than 85 percent of the population and follow all professions including

begging. Muslims, who are numerous in the Dharwar and Bijapur districts, are farmers in villages and traders, labourers, servants in various Government Departments etc., in the towns. Jains are very numerous in the Belgaum district where more than 75 percent of the Jain population of the Bombay Karnataka is found. Most of them are agriculturists. Christains are mostly converted Indians. They are generally well-to-do and are engaged in trade, civil, educational, transport and other services. The remaining people are very few (836) and consist of Zoroastrians (435), Buddhists (333), Sikhs (47), Jews (19) and tribal people (2).

Languages:- Kannada is the language of the majority of the people. About 80 percent of the people speak Kannada in the Bijapur and Dharwar districts. In the Belgaum district two-thirds of the people speak Kannada and the majority of them are found in the countryside. In N. Kanara the official language is Kannada and most people can speak that language but in the coastal area the Konkani dialect is the mother tongue.

The largest number of the **Marathi**-speaking population is found in the Belgaum district where nearly a quarter of the population speak that language. This is especially the case in the district head quarters and the southwestern part. 3 to 4

percent of the people in the Bijapur district speak Marathi and they are mostly found in the large towns of the Indi and Sindgi talukas which were formerly included in the Sholapur district. In N. Kanara only the Supa Peta has Marathi-speaking population to some extent.

Hindi and **Hindustani** are spoken by 12 percent of the people consisting of mostly Muslims though some of them speak Kannada or Marathi or both in addition. Some Muslims, especially those that live in villages, do not know Hindustani: this may be due to their indifference towards or want of facilities for learning the language. In the areas bordering the Nizam's Dominions Hindus also speak Hiudustani. After the recent drive for a ***lingua franca*** for India many people have taken to Hindi and can read, write and converse well in that language. The percentages of peoples speaking the other languages like Marwari, Gujarati, Tamil, Telugu, etc., are very small.

Distribution of Settlements:— In this case a few generalisations are possible. Firstly from west to east the individual settlements gradually become larger and larger and secondly the distances between them gradually increase. As a majority of the population of N. Kanara lives on the coastal area a number of large and small settlements is found here; however

the distances between them are very small. On the Above Ghat forested area the whole population is very small and consequently the settlements are also small and few in number. In this area only one house may often form a settlement. However, the distance between any two settlements is not great. In the eastern-most part of the N. Kanara district and the western parts of the Belgaum and Dharwar districts settlements are not exactly dispersed but the individual settlements are small and the distances between them are also small. Each is only a hamlet containing a few houses. In the eastern part of the Belgaum district and the middle part of the Dharwar district settlements are nucleated, comparatively large and situated at small distances form each other. In the eastern part of the Dharwar district and all over the Bijapur district settlements are few, large in size and are widely spaced. The explanation is to be found in the prevailing climatic and other natural conditions. In the siting of settlements the availability of drinking water is of prime importance. In the west, where the rainfall is great and the physical features are unfavourable for movement, water is found everywhere and people prefer to live near their places of work which may be a garden or a rice field. Only after the harvest they visit large market centres where they buy their other necessities of life. In the

east rainfall is small, land is flat and communications from one place to another are easy. People live on a site which is conveniently situated for their daily work and where drinking water is easily available. If drinking water is not available on the otherwise favourable sites artificial ponds and wells are constructed. Here the amount of cultivated land per pair of work animals also is large. Under such circumstances settlements are not closely spaced. There is, therefore, a correlation between the distribution and the size of settlements on the one hand and the environment on the other.

Most of the settlements are very old as proved by archaeological and historical finds. Some of the settlements are in ruins today; there are others which have dwindled; while there are still others which have grown in importance enormously.

Most of the settlements seem to have been sited by trial. In the old days the following were the chief considerations for the siting of settlements. (a) **Sufficiency of drinking water** from springs, wells, streams or reservoirs: Settlements near the sites of water supply are the most numerous in the Bombay Karnataka. One may take any settlement and more often than not, it is either at the foot of a hill where springs issue, or on the bank of a large or small stream

or else just near a natural lake (Fig. 19). Settlements in basin structures where water is available in wells at small depths should also be included in this category. (b) Sites having **good approach** from surrounding places: Those settlements which have very good

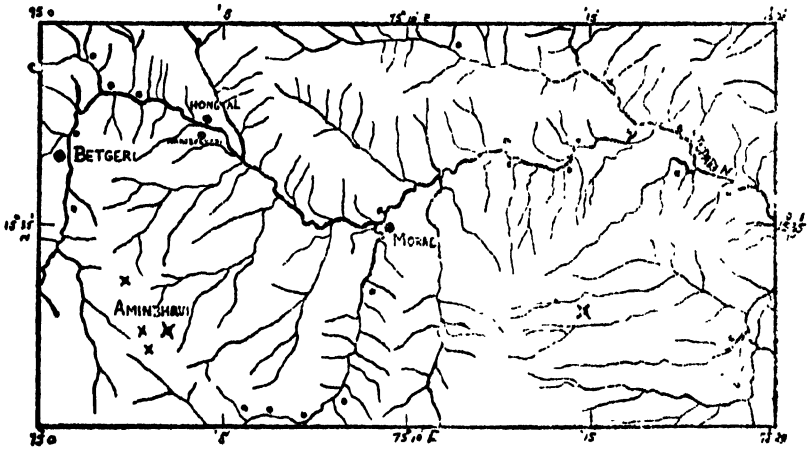


Fig. 19.
Diagram showing the predominance of settlements on the banks of streams (dots) as against those not along stream courses (crosses).

approaches have grown into important towns today; e.g., Gadag, Hubli and Bagalkot. (c) **Defensible sites:** These special sites were selected for strategic purposes. Most of them are in ruins or in a dwindled state today; e.g., Gajendragad, Parasgad and Kittur. (d) **Protective sites:** Those in which residents can protect themselves from intruders either by building walls and watch

towers or by retiring to nearby hills at the time of an attack from outside. (e) **Sites near bridges or fords:** e.g., Mukutkhan-Hubli on the Malaprabha, Karajgi on the Varda, etc. (f) **Coastal sites:** These may be near small harbours which may be used for anchoring fishing boats, near large harbours which may develop the site into a large port, or near places where some industry connected with sea water may be started such as salt-manufacturing, fish-curing, etc. Examples are found on the west coast of the Bombay Karnataka. (g) **Sites of some religious importance:** These may be places where some religious person lived, or died or where an important religious institution was established. Examples are Gokarn, Ulvi, etc.

After the advent of the railways and the construction of good roads some of the former settlements which were centrally situated and in addition were served by the means of communications developed quickly, extended their spheres of influence and became important market or industrial centres. Others which were far from the means of communications dwindled in size. In the modern times defence problems for individual settlements are not of great importance and therefore most of the old fortified settlements are either in ruins or are reduced in size.

CHAPTER XV

Towns

USUALLY, the head-quarters of the districts are the largest towns in those districts; but Hubli and Gadag are exceptions. The other towns of any note are the taluka head-quarters. Nipani has grown on account of the tobacco trade and Guledgudd and Ilkal on account of the hand-loom industry. In the following paragraphs short accounts of the important towns in each district are given.

Belgaum :— (15° 52′ N : 74° 34′ E.):—Belgaum is the head-quarters of the Belgaum District and the Southern Division and is 48 miles northwest of Dharwar on the main road between Poona and Bangalore. From the twelfth to the eighteenth century it was under the different ruling dynasties of Karnataka and was annexed to British India by General Munro in 1818. Belgaum has a fort which is supposed originally to have been built by a Jain king and later reconstructed and strengthened by Asadkhan. There are two parts, namely the city with its suburb Thalakvadi and the Cantonment including the Fort. The former had a population of 41,204 and the latter 11,430 in 1931.* Belgaum is an

* In recent times there is a tendency for the population to move to urban areas and the populations of towns, therefore, are believed to have increased by 5% or even more between 1931 and 1941 in addition to the general increase which is estimated to be about 10%.

important market centre for rice, *ghee*, jaggery (raw sugar) and timber. Hand-loom industry, rice-hulling, wood and furniture-making, body-building of buses and lorries, an oil-pressing mill employing about 70 workers, a match factory manufacturing annually more than 5,000 gross match boxes, tanning, etc., are the chief industries. It is an educational centre and has three University colleges and a number of other educational institutions. Except at the time of the S. W. monsoon the climate is very bracing all the year round. Belgaum is, therefore, a summer resort for the rich as well as the poor and is popularly known as the "poor man's Mahabaleswar". The town of Shahapur (Pop. 11,704) in the Sangli territory, about a mile south of Belgaum, is an important trading and weaving centre and is noted for gold and silver articles. Shahapur has a few hosiery works.

Bailhongal (15° 49′ N : 74° 52′ E.) about 27 miles east of Belgaum, is an important market centre for cotton, *jola*, groundnut, butter, wheat and rice. It has a regulated cotton market and every year gets, on an average, about 50,000 *dokras* of seed-cotton. It has seven cotton-ginning and two cotton-pressing factories. Hand-loom industry produces silk-bordered *dhoties* and other piece goods. Out of a population of

9,572 majority of the people follow the agricultural profession.

Gokak (16° 11′ N: 74° 52′ E) is situated at the confluence of the Ghataprabha and the Markandeya rivers, about five miles from Gokak Falls and eight miles to the southeast of the Gokak Road Station. Gokak Falls has a cotton spinning mill which is worked by the electric power generated at the water falls. Here the water of the Ghataprabha falls to a depth of about 170 feet across the Kaladgi sandstones and further a gorge is formed in the same rocks. The Gokak town had a population of 11,866 in 1931. It deals in jaggery, chillies and grain and has a small cotton market. Hand-loom industry, making of fine wooden toys and models are the chief industries. Rough paper industry was very important in the old days. There are reserved forests on the hills near Gokak and mica occurs in small quantity in the vicinity. There is a Government Agricultural Research Farm in Arbhavi near Gokak.

Athni (16° 44′ N: 75° 6′ E Population : 13,561) is on the road between Bijapur and Shedbal Railway Station about 21 miles east of the latter. Athni is the next important market place for cotton after Bailhongal in the Belgaum district. Groundnut, jaggery, wheat and other grains are the other commodities that come to the Athni market. There

are cotton-ginning factories and hand-looms in the town. The wheel-wrights of Athni are famous.

Khanapur (15° 42′ N : 74° 35′ E. Pop. 4,881), on the Malaprabha river, is about 17 miles south of Belgaum. It is a market centre for rice, parched rice, pressed rice and gall-nuts The pottery of Khanapur is famous. There is a tile and brick factory which utilises the impure kaoline that is found nearby. Laterite bricks are quarried near the town. A few miles west of the town is the village Asoga where a project of dammirg the Malaprabha and constructing a reservoir in order to supply water for irrigation was under consideration.

Of the remaining towns Nipani should be mentioned first. **Nipani** (Pop 17,857) is a well known market centre for tobacco and has a large number of industries connected with tobacco. The Agri-cultural Department has recently started an experimental station in order to evolve a variety of tobacco suitable for the manufacture of cigarettes and for demonstrating the superiority of improved tobacco. The town is also a market place for chillies and jaggery. **Nandgad**, situated at the meeting place of the *Malnad* and *Gadinad* tracts, was an important market and industrial place. Its importance has been lessened now-a-days on account of its great distance from the railway line. Hukeri,

Chikodi, Sankeswar, Saundatti and Kittur, are small market centres for local products. Kittur, Halsi, Saundatti and Sogal are historical places in the district. The Yellammanagudd, about two miles east of Saundatti, Vaijanath near Belgaum and Mangsoli are famous places of pilgrimage and have yearly and half yearly fairs.

Bijapur (16°50′ N: 75°47′ E.):— Bijapur is the head-quarters of the district and is situated on the Gadag-Sholapur branch of the M. & S. M. Ry. It was one of the largest towns of South India between 1489 and 1686 A. D. and has world famous monuments built by the Adilshahi kings. The Gol Gumaz, containing the only whispering gallery in India, is the most famous of them all. As Bijapur is situated in a dry tract the first Adilshaha took precaution to provide for sufficient water-supply for the city by building the Torvi Water Works. The town is a market centre for cotton, *jola*, wheat, oil-seeds, etc., and has cotton ginning and oil pressing factories. Iron and copper utensils, chemicals and dyes are manufactured in the town. The population of the town was about 40,000 in 1931. The Wilson Anti-Famine Institute does agricultural propaganda work and the Dry Farming Research Station, which is financed by the Imperial Council of Agricultural Research, has already done very useful work.

Bagalkot (16°12′ N: 75°45′ E. Bopulation: 15,597) is the second important town in the Bijapur district and is 58 miles south of Bijapur. It is the most important commercial town for the whole of the district and handles cotton, groundnut and other oil-seeds, *jola*, wheat, pulses, etc. There are a number of ginning and pressing factories of cotton. A textile mill is likely to be started in the near future. The town is famous for country blankets. Other industries include groundnut hulling industry, hand-loom industry, copper and brass industry and rough-paper industry. The town is the head-quarters of the Karnataka Chamber of Commerce.

Badami (15°55′N: 75°45′E.) is a small place today. It is well known for the Badami caves and is historically important because it was the capital of the Chalukyas who ruled over the whole of Karnataka in the sixth and the seventh centuries A. D. The town lies on the Kaladgi red sandstones and posseses the famous Jain excavations and cave temples ascribed to 650 A. D., the three Brahminical caves and the worn-out Flight of Steps. Iron was smelted near Badami upto very recent times. Banashankari, about three miles from Badami, is a place of pilgrimage.

Ilkal (Population: 14,267) is a well known place for hand-loom industry and so are **Guledgudd**

(Population : 16,756), Kamatgi and Kerur. In Ilkal there are more than 3,000 hand-looms which turn out silk *Saries* with elaborate designs (Ilkal *Saries*) worth about Rs. 1,700 a day. Guledgudd has about 3,500 looms and produces cotton and silk *khanas* and *petas* worth about Rs. 10,000 every day. Kamatgi produces cotton and mercerised bordered *khanas* of the value of about Rs. 5,000 a day. Kaladgi has slate quarries nearby. Pattadakallu, Talikote and Aihole are some of the historical places. Bagewadi is the birth place of Basaweshwar, the reformer of the Lingayat cult, and Kappadi Sangama, at the confluence of the Malaprabha and the Krishna, is a place of pilgrimage.

Dharwar (15° 27′ N : 75° 3′ E.) is the head-quarters of the district and the agricultural head-quarters of the Southern Division. It lies on the Poona-Harihar section of the M. & S.M.Ry. and is 48 miles southeast of Belgaum by road. It is a town made up of seven small separate units viz., Saidapur, Saptapur, Hosa-Yellapur, Gulganjikopp, Kamalpuar Madihal and Haveri Peti; and even today there is unbuilt space between some of these units. The muncipal area of Dharwar, therefore, is very large. Dharwar has a fort which is in ruins today. The population was 41,671 in 1931. It has cotton-ginning and cotton-pressing factories, rice and pulse-hullers,

oil-pressing factories and rice-parching and rice-pressing works. It is a market place for cotton, *jola*, pulses, groundnut, etc., and also is an educational centre having a University college and a number of other educational institutions. There is an Agricultural Research Station about three miles east of the town and another one at Mugad about nine miles west of Dharwar.

Hubli (15°20'N: 75°12'E.) is the most important commercial and industrial town of the Dharwar

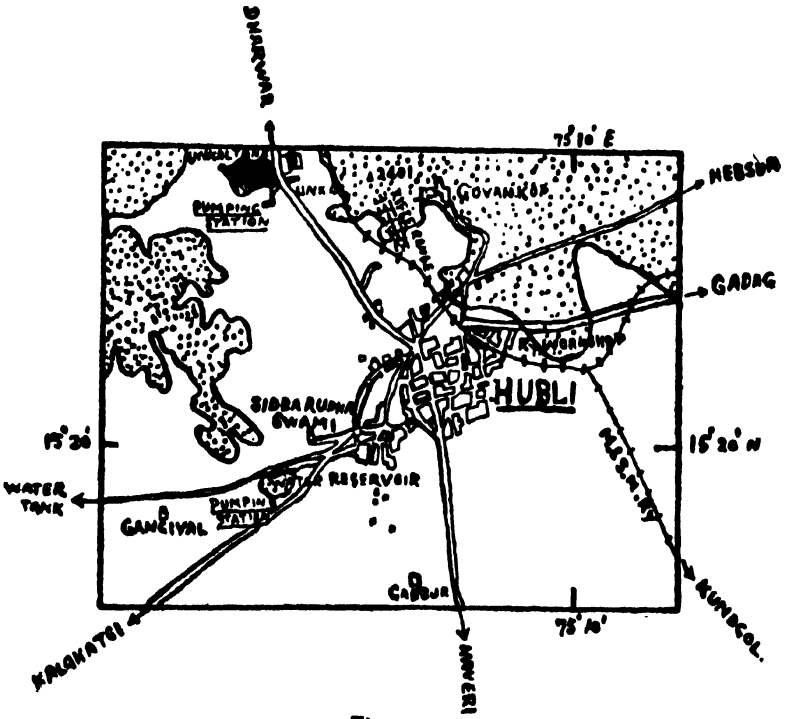


Fig. 20.
The site of the HUBLI Town.
(Scale: 1" = 2¼ miles. Ground over 2,100 ft. is stippled.)

district and is the largest town of the whole of the Bombay Karnataka with a population of 89,982 in 1931. It is an important railway junction and is the head-quarters of the northen sections of the M. & S. M. Ry. It is a node for roads (Fig. 20). The Railway workshop employs about 4,000 people belonging to the Bombay Karnataka and other places, and builds various kinds of rolling stocks, assembles and repairs railway engines and manufactures spare parts. Hubli is the largest market for cotton and handles seed-cotton giving about 50,000 bales of lint-cotton. It has several ginning and pressing factories, spinning and weaving mills, rice and pulse-hullers, copper, brass and iron works aud is famous for its hand-loom industry producing goods worth about Rs. 2,000 every day. It is known for the Siddharudha Swami Math which attracts a large number of devotees from Bombay and the Konkan.

Gadag (15°25'N: 74°42'E.), situated on the plateau near the northern limit of the Kappat Ranges (Fig. 21), is a railway junction for lines going towards Hubli, Guntakal and Sholapur. It had a population of 45,852 in 1931. It is the second largest market centre for cotton in the Bombay Karnataka and has a number of cotton-ginning and cotton-pressing factories. Groundnut is another important product from which oil is extracted in the local expellers. It

has spinning and weaving mills and is also famous for hand-loom manufactures, producing all kinds of ladies' wear worth about Rs. 1,250 every day. The Karnatak Chemical Works manufactures toilet materials, drugs and other chemicals. Gadag is only next to Hubli in importance as a commercial and

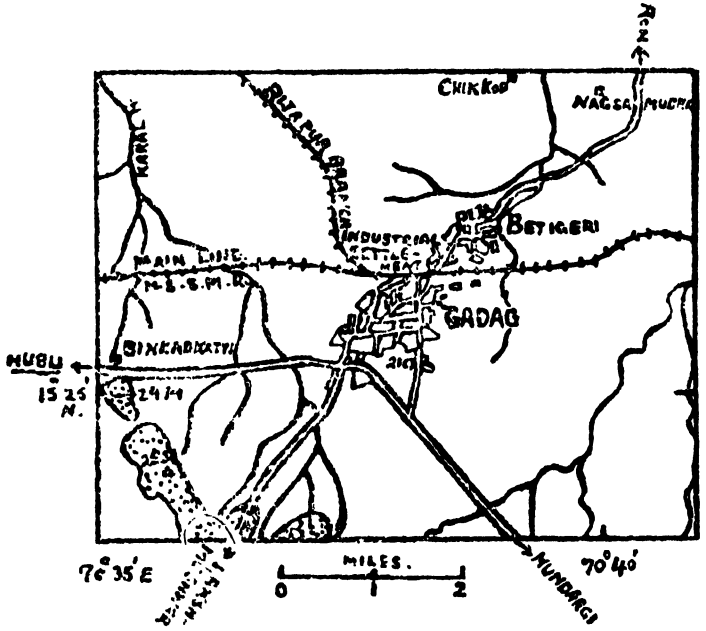


Fig. 21.

The twin settlement of GADAG-BETIGERI

(Ground over 2,300 ft. is stippled.)

industrial centre. It is growing rapidly and the built-up area is extending every year.

Nargund (Population : 7,545) is the third largest market centre for cotton in the Dharwar district and collects about 30,000 *dokras* of seed-cotton every year. **Haveri** (Population : 9,657) is the largest market for cardamum after Sirsi. Cotton is also recently coming to Haveri and the town has few cotton-ginning factories. Devihosur, about three miles from Haveri, has the only Agricultural School in the whole of the Bombay Karnataka. **Byadgi** (Population 7,290) is a small place but has a big reputation as a commercial centre for betelnut, chillies, jaggery and black pepper. It has a few cotton-ginning factories. **Ranibennur** (Population : 16,967) is known for its hand-loom and dyeing industries. It is also famous for betel leaves. It is a growing cotton market and has a few cotton-ginning factories and a cotton-pressing factory.

Karwar (14°48' N: 74°11' E. Population : 16,122) is the head-quarters of the North Kanara district and is situated on the southern shore of the Karwar Bay away from the mouth of the Kalinadi and the Creek (Fig. 17 and Plate IV a.). It has the most protected harbour of all the N. Kanara ports but the water in the harbour is shallow and requires dredging. If a railway is built from Hubli, Karwar is likely to become the port of a major portion of the Bombay Karnataka. Today it is used as a roadstead by

the coastal steamers. There is a good deal of fishing, and industries connected with fishing such as curing, drying and salting of fish are commonly found. Karwar has a fruit-canning factory which canned 36,000 tins of mango pulp and 250 tins of pine apple and employed 30-35 people in the mango season of 1939.* Timber is the most important export product. Furniture industry is found in the town. The approach by road is very difficult because there are forest-covered hills on the east and south and the wide creek of the Kalinadi on the north, but it is easily approached by sea except at the time of the S. W. monsoon. The town extends quite a long way along the beach. The annual trade of the port is of the value of about Rs. 16,00,000.

Sirsi (14°36′ N: 74°54′ E. Population : 7,767) is the second most important town of the N. Kanara district and is the largest town in the Above-Ghat area. It is 63 miles southwest of Hubli and the nearest railway is not less than 45 miles. Sirsi is the chief market centre for betelnut, rice, cardamum, pepper and banana fruit and has industries connected with betelnut, paddy, sandal-wood and ivory. Large quantities of betelnut and cardamum are sent out to all places and especially to Bombay via Kumta. About Rs. 30,00,000 worth of trade is done every year.

* Report of the Bombay Econ. & Indust. Survey Committee 1938-40. Vol. I. p. 86.

Kumta (14°26′N: 74°27′E. Population: 14,554) is the second largest town in the Below-Ghat area and is situated on the northern shore of the Kumta River Creek. It is 112 miles southwest of Dharwar and a very steep road has to be negotiated near Devimane Ghat before reaching Kumta. It is the largest market centre of the coastal area and trades in rice, betelnut, cocoanut and jaggery. Fishing is an important industry. Kumta has an Agricultural Research Station.

Honavar (14°17′N: 74°29′E. Population: 7,955), on the northern side of the Sharavati Creek, is eleven miles south of Kumta. It is the largest port of N.Kanara but has a smaller population. Honavar is famous for its coir industry and has an industrial school of the All India Village Industries Association. Other industries include making of buttons and other articles from horn and nuts, and carving in sandalwood and ivory. There are large casuarina plantations in Kasarkod on the southern side of the Sharavati Creek. Bee-keeping has been started very recently.

Bhatkal (13°59′N: 74°35′E. Population: 8,938) is a small town but has some specialities. It has a very good natural and deep harbour (Plate IV b.). If the projected line of the Mysore State Railway is constructed the habour will be developed more rapidly. A large proportion of her population belongs to a section of Muslims called *Navayats*. It is said that

they follow some Jain traditions. Most of them are well-to-do and migrate to all parts of India and Ceylon to do business.

Siddapur is a small market place for betelnut, rice and spices. Dandeli, at the railway terminus of the branch from Alnavar, is the chief timber depot of N. Kanara. Banawashi was the capital of the Kadambas and has the well known Madhukeshwar temple which is supposed to have been built at the time of the Satavahanas in the first century B. C. Swadi (Sonda) is another historical place. Ulvi is a religious centre for the Lingayats. Gokarn (Population: 8,506)is a well known religious centre for Hindus, and is called Southern Kashi (*Daxina* Kashi).* The

* The story goes that Ravana of the Ramayana Epic obtained the *Prana-Linga* of Siva by performing a rigorous penance and Siva wanted his *Linga* back. One day while Ravana was journeying near the site of Gokarn, evening fell and he wanted to perform the evening prayers. Ganapati (son of Siva) was made to stroll about intentionally at that very locality and none else was there. Ravana wanted to keep the *Linga* in somebody's custody until he finished his prayers. None but Ganapati could be found there. He accordingly had to request Ganapati to keep the *Linga* with him for the time being. Ganapati agreed on the condition that he would shout Ravana three times and if the last shout was not answered the *Linga* would be deposited on the ground Ravana agreed and went to his prayers after giving the *Linga* in the hands of Ganapati. When the former was deeply engaged in his prayers Ganapati shouted him thrice : the last call was not answered and he, therefore, kept the *Linga* on the ground and went away. Ravana came back after his prayers and saw the *Linga* on the ground. He was furious with rage and tried to lift the Linga; but the *Linga* was deeply rooted in the ground and would not come out. With his mighty strength Ravana screwed out the top part of the *Linga* and had to leave the lower portion of the *Linga* with a screw-like head in the ground. The present *Linga* at the Mahabaleswar temple, which has a screw-like head, is supposed to be the remnant part of the above story and is worshipped as such.

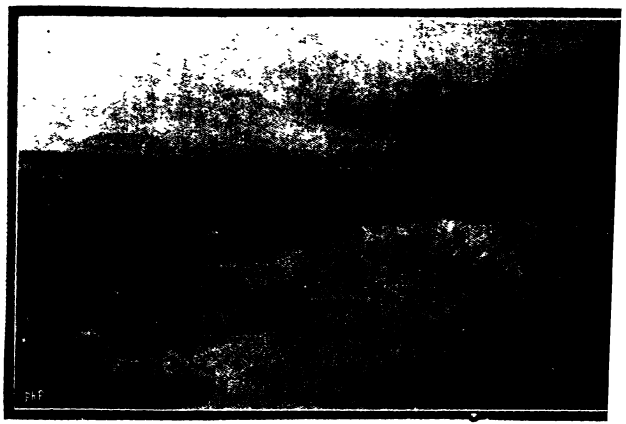
town is full of brahmins (*bhats*) who charge a fee to help the devotees in worshipping god Mahabaleswar. Salt is dried at Sanikatta about a mile east of Gokarn. Sanikatta is also one of the large ports of N. Kanara. Gersoppa is another historical place and the queen of Gersoppa was called " The Queen of Pepper ". The Jog Falls is very famous.

PLATE IV. a.

(Photo by B. S. Sheshgiri)

showing the Karwar Bay and the Devgad with its Light House in the Background, Creek in the Foreground and a small Strip of Land with Casuarina Plantations in the Middle.

PLATE IV. b.



(Photo by B. S. Sheshgiri)

View of the Bhatkal River and Harbour as seen from Light House near the Bhatkal Bay.

The Cocoanut Plantations along the bank of the River and the Western Ghats in the Background may be noted.

CHAPTER XVI

Economic Conditions

THE economic condition of the majority of the people is not good and most of the cultivators are neck-deep in debt. Loans are taken both for economic and uneconomic purposes and once a debt is contracted almost invariably a vicious circle starts. If by chance there is failure of crops or low prices prevail the debtor cannot repay the whole of the loan. The money-lender tries to get as much as he can. The farmer's family is left with very little to live on; the farmer cannot attend to his farm work properly; there are not enough means to keep up the fertility of the soil; the result is that the crop-yields fall. Still the debt is unpaid and the vicious spire goes on and on until the farmer has debts more than the value of the property he owns. He becomes bankrupt and is obliged to sell his land and turn into a tenant farmer or an ordinary labourer. A tenant or a labourer does not usually look after the land as well as an owner-farmer. Therefore the produce of the land ultimately comes down. In addition there are visitations of famines, pests and price fluctuations.

To mitigate this state of affairs *takavi* loans, simple and multiple co-operative societies, land

mortgage banks, regulated markets, etc., have been started. It should be noted that most of these organisations can help only those farmers whose debts do not go beyond about 60 to 70 percent of the values of their properties. Those whose properties are worth less than their debts cannot be helped by these means. Such people form a good proportion of the farmers. The beneficial results of the above organisations have not come up to the expectation.

In recent years serious attention has been given to rural uplift work. The activities include construction of rural model houses, pure-water supply, medical aid, killing disease-germs, construction of roads, bridges and wells, mass education in day and night schools, training in cottage industries, starting subsidiary industries, propaganda with the help of films, lanterns, gramaphone records, demonstrations, exhibitions, shows, prizes and medals, supply of improved implements, good seed and pedigree bulls, technical help, control of pests and diseases, setting up of Panchayats, agricultural training in primary schools, starting co-operative societies, gun clubs, contour bunding and so on. In order to obtain beneficial results, co-operation is required between the farmers on the one hand and the officers of the Agricultural, Rural Development, Co-operative and Revenue Departments on the other.

Migrations and Famines.

Migrations may be temporary or permanent; both these may be due to the scarcity of work, lack of healthy conditions, ravages of wild animals or profitable attractions from outside. Temporary migration in search of work, as for instance on fields at the time of harvest, or in towns are less important than permanent migration. In the Above-Ghat area of the N. Kanara district firstly, diseases and damage by wild animals are very prevalent almost through out the year and secondly, there is an increasing tendency on the part of the land owners to rent their land, go out and settle in more favourable areas. There is also migration from the famine areas of the Bombay Karnataka to its other parts and to the neighbouring areas. There is, therefore, a decrease of population in 1931, as compared with that in 1921, in the Supa Peta (6%), and in the talukas of Yellapur (10%), Sirsi (3%), Siddapur (2%), Bagalkot (4%), Nargund Peta (9%), Ron (5%) and Navalgund (18%). Famines are mostly due to the scarcity of water for agriculture but rat, locust and insect-plagues, and trouble of wild animals, especially pigs, aggravate the matter. The following are some of the **measures of protection** against famines: (a) Administrative measures such as suspension and remission of land revenue, issue of *takavi* loans,

forest conservancy, etc. (b) Public works such as building protective irrigation works, sinking wells, building roads and railways, etc. (c) Standing measures such as storing fodder for use at the times of famines, use of famine foods and fodders, etc.

Trade

There is a considerable variation in the trade of the different districts. In N. Kanara betelnut, cocoanut, rice, spices and timber are the chief export products. The trade centres are Sirsi, Kumta, Karwar, Sanikatta and Honavar. Cotton, grain, and oil-seed products are the chief export commodities in the eastern parts of the Dharwar and Belgaum districts and the whole of the Bijapur district. There is considerable local trade in the other agricultural commodities all over the Bombay Karnataka. Besides cotton and oil-seeds the Belgaum district exports rice, chillies, jaggery, *ghee* and tobacco. Manufactured goods, textiles, machinery and food stuffs like tea, sugar, condiments, etc., are the common imports of all the districts. Trade is carried on mainly by private traders and independent firms. Joint stock trading companies are very few in number.

CHAPTER XVII

Natural Divisions and General Features of the Districts

THE geographical aspects of the Bombay Karnataka as a whole have been discussed so far and now an attempt is made to divide the area into natural divisions. The following four divisions suggest themselves: (i) the Below-Ghat coastal division; (ii) the Above-Ghat hilly and wet division; (iii) the very favourable transition belt; and (iv) the dry eastern division. They are shown in Figure 22.

The **Below-Ghat coastal division** is flat with transverse hills and creeks and gets a heavy rainfall. Rice, cocoanut, sugarcane and spices are the chief crops. The industries are small and consist of fishing and fish curing, handling of timber and other forest products, manufacture of salt from sea water, wood and ivory carving, furniture making and coir industry. The density of population is fairly high. Even though there are quite a number of large settlements the general feature is one of dispersed settlements. The means of communications are not good and the difficulties of their construction are increased on account of the transverse hills and creeks and the wall-like face of the Western Ghats. Coastal water communications are also few. As there are very few

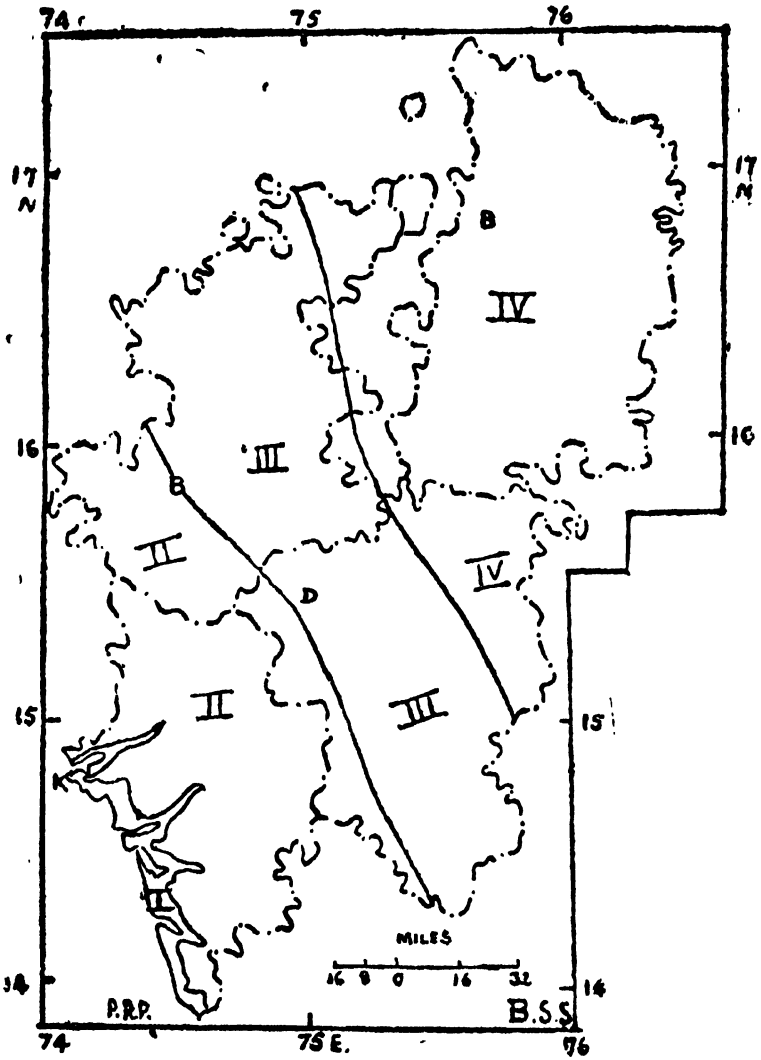


Fig. 22.

The NATURAL DIVISIONS of the Bombay Karnataka.

I. The Below-Ghat coastal division. II. The Above-Ghat hilly and wet division. III. The very favourable transition belt. IV. The dry eastern division.

attractions in this division large numbers of people go out permanently in order to seek better prospects. Karwar, Kumta, Honavar, Bhatkal, Ankola and Gokarn are the only large towns. Sanikatta is important on account of its salt works. Honavar is the largest port of this division. Bhatkal has a small but protected and deep-water harbour and is likely to be developed in the near future. This division exports timber, fish, salt, spices, betelnut and cocoanut.

The **Above-Ghat division** is very high over the sea level and thus has a lower temperature. The rainfall is very heavy. Most of the area is covered by dense forests. Deep valleys and large number of streams are very characteristic of the division. In the clearings of the forests, in level areas and on the sides and near the heads of the streams one is likely to find a few large settlements. The population is very small and the settlements are much dispersed. The economic condition of the population is not good. Crops consist of rice, betelnut, spices, banana and a small amount of sugarcane. Exploitation of timber, gathering of forest products and wood and ivory carving are the chief industries. This division is very unhealthy and is infested with a large number of harmful wild animals. Large numbers of people have migrated from this area and permanently settled elsewhere. The means of communications are very

few and they are in bad condition. Sirsi, Siddapur and Haliyal are the only towns of some note. Exports of this division consist of timber, betelnut, spices and rice.

The **transition belt** is the best area in the whole of the Bombay Karnataka. The land is plateau-like and is covered with fairly fertile soil. The climate is favourable and the rainfall, though lesser than in the first and second divisions, is well distributed and dependable. The variety of crops is large. Rice is a very unimportant crop. Wheat is grown only in the east. Large quantities of *jola*, pulses, cotton, oil-seeds, sugarcane, chillies and other condiments, tobacco and betel leaves are produced. Industries are well developed. Hand-loom industry, mill cloth industry, tobacco industry, cotton ginning and cotton pressing factories, oil mills and chemical industries are the chief ones. The numbers of both large and small settlements are great. The division has the densest population distribution in the whole Bombay Karnataka. Hubli, Dharwar, Haveri, Ranibennur, Bailhongal, Gokak, Nipani, Hukeri and Chikodi are some of the large towns. Belgaum lies just on the western border of this division. There are very good means of communications. Large quantities of cotton, grains, oil-seeds, edible oils and hand-loom and mill cloth are sent out of this division.

PLATE V.

(Photo by B. S. Sheshgiri)

Typical Peasants of the Below-Ghat Area of North Kanara.

Notice their scanty Clothing.

The **dry eastern division** is plateau-like and gets a small amount of rainfall, which is uncertain. The largest fall of rain occurs in the last months of the year. Famines frequently visit this division. Soil is good over a large part. The chief crops are *jola*, cotton, wheat, other small millets, pulses and oil-seeds. The chief industries are those of hand-loom, mill cloth, cotton ginning, cotton pressing and oil. Settlements are large and the distance between any two of them is great. Gadag, Bijapur, Bagalkot, Guledgudd and Ilkal are the chief towns. The means of communications are fairly good. Frequent famines have led to permanent migration of the population to other areas and has resulted in the reduction of the population of many a taluka. The chief exports of this division are cotton and cereals.

It is clear from Figure 22 that the political boundaries of the districts do not coincide with the boundaries of the geographical divisions. The **North Kanara** district is made up of the Below-Ghat division on the west and the Above-Ghat division on the east. The **Belgaum district** consists of a small area belonging to the Above-Ghat division, a large area to the transition belt and a small area to the eastern division. The **Dharwar district** has a very small area on the west which may be included in the Above-Ghat division. The remaining area belongs to the

transition belt on the west and the eastern division on the east. The whole of the **Bijapur district** lies in the eastern division.

CONCLUSION

So far the geographical features of the Bombay Karnataka have been discussed and now a few lines may be written in conclusion. India is predominantly an agricultural country and the Bombay Karnataka is no exception to this statement. Sir F. H. Sykes remarks: "From time immemorial India has been an agricultural country: and it is quite certain that, whatever may be the history awaiting her in the long vistas of the future, agricultural she must primarily remain. Industries may be developed; more and more great towns may spring up; in all kinds of ways the surface character of Indian life may be changed; but the overwhelming majority of Indians will still be tillers of the soil and in the Indian village will be, as now, the true heart of the country. To work, therefore, for the increased happiness, prosperity and enlightenment of the Indian villager is to work for a permanent cause."* Except in a few localities the growing of crops depends on rain water. The rainfall is seasonal everywhere and in the east is scanty and the fall is spasmodic. If water is available at all times of the year valuable crops can be produced in almost all

* Sir F. H. Sykes: Manual of Village Improvement: Bombay, 1933. p. 1.

places. Attention is therefore, invited towards extending irrigation facilities. Good work has been and is being done by the Department of Agriculture as regards crops and crop-production but the improvement of animals is still very much neglected. Improvement by grading as an effective means has been suggested.

Industries employ the next largest percentage of the people. Industries connected with the forest products stand out to be very promising. These can be very easily worked with the help of electric power which can be generated at the various falls mentioned in the text. One or two more cotton textile mills may profitably be started. Cottage industries should be subsidised and encouraged to a greater extent than at present. In a predominantly agricultural country suitable cottage industries are perhaps the only means to engage the people in their otherwise idle hours. More of such organisations as the All India Village Industries Association, All India *Charkha Sangha*, etc., should be started and financed at least in their initial stages.

The total railway milage is small and all the lines are not placed properly. One east-west line connecting Bagalkot and Belgaum and another connecting Hubli and Karwar have been suggested.

The latter may give an inpetus to the development of the Karwar harbour. Some new roads, and bridges and causeways on the existing roads, have been suggested. This applies especially to the N. Kanara district.

Finally more ways and means should be found to ameliorate the condition of the peasants. They are the back-bone of the country and therefore their welfare is the welfare of the whole country. Every peasant should be made to take as much benefit out of the development and other works as possible. The Bombay Karnataka should make up for the backwardness in its political and economic advancement and then only she can occupy a proud place in the United Karnataka when the latter comes into existence.

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APPENDICES

APPENDIX A. Temperatures.*

Bombay Karnataka : The average monthly and annual maximum and minimum temperatures and absolute maximum and minimum temperatures at the meteorological stations situated in the Bombay Karnataka.

Station	Temperatures.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average annual	Absolute Max.	Absolute Min.
	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰	F⁰
Belgaum.	Max.	83	88	94	96	93	81	76	76	79	83	82	82	85	108	44
	Min.	58	59	64	67	68	68	67	66	65	65	61	58	64	(April)	(Feb.)
Bijapur.	Max.	86	91	97	101	101	92	87	87	87	89	86	85	91	110	44
	Min.	60	64	70	74	74	72	71	70	70	68	61	57	68	(May)	(Dec.)
Karwar.	Max.	86	86	87	89	90	85	83	82	83	85	88	88	86	98	53
	Min.	66	67	72	78	80	76	75	75	74	74	70	66	73	(Feb)	(Feb.)
Gadag.	Max.	86	91	96	99	99	88	83	84	85	87	85	83	89	107	53 (Dec.
	Min.	62	65	69	72	73	71	70	69	69	69	65	61	68	(May)	& Jan.)
Honavar.	Max.	90	87	88	89	89	84	82	83	84	86	90	90	87	97	59
	Min.	68	69	72	77	78	75	74	74	74	73	71	69	73	(Nov.)	(Dec.)

* Memoirs of the Indian Meteorological Department : Vol. XXII. Part III. 1914., and partly from information kindly supplied by the Director General of Observatories, Poona.

Bombay Karnataka : Average monthly and annual
Stations situated in the Bombay Karnataka.

Station.	Jan.	Feb.	Mar.	Apr.	May	June
BELGAUM Dist.						
1. Belgaum.	0·13	0·05	0·27	1·60	2·46	8·14
2. Chandgad.	0·13	0·05	0·33	1·45	1·87	21·78
3. Khanapur.	0·07	0·06	0·32	1·57	2·29	12·79
4. Sampagaon.	0·05	0·03	0·28	1·62	2·81	4·44
5. Saundatti.	0·08	0·06	0·26	1·29	2·34	2·96
6. Gokak.	0·12	0·03	0·36	1·47	2·38	3·41
7. Chikodi.	0·08	0·08	0·31	1·69	2·27	3·86
8. Hukeri.	0·06	0·10	0·43	1·66	2·49	3·83
9. Athni.	0·12	0·03	0·14	1·29	2·33	3·13
BIJAPUR Dist.						
1. Bijapur.	0·08	0·06	0·26	0·70	1·26	3·28
2. Indi.	0·08	0·10	0·21	0·63	0·92	3·75
3. Sindgi.	0 17	0 11	0·38	0·77	1·00	3·82
4. Bagewadi.	0·08	0·14	0·30	1·03	1·34	3·38
5. Mudebihal.	0·03	0·12	0·18	0·92	1·64	3·21
6. Bagalkot.	0·03	0·09	0·20	0·93	1·78	2·96
7. Bilgi.	0·07	0·05	0·27	0·86	1·78	3·06
8. Badami.	0·02	0·09	0·22	0·94	2·09	2·63
9. Hungund.	0·08	0·05	0·26	0·84	1·71	2·50
10. Ilkal.	0·06	0·05	0·24	1·03	1·87	2·46

Gazettes of the Bombay Government for the year 1937 and the Printing and Stationery, Bombay, 1925.

rainfalls, in inches, as recorded in the Meteorological

July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Total
10·15	9·67	4·88	4·67	1·74	0·37	50·13
42·10	22·17	7·20	4·80	1·53	0·44	103·85
24·97	13·62	4·31	4·13	1·51	0·38	66·02
5·34	3·67	4·14	4·86	1·48	0·40	29·12
3·25	2·69	5·11	4·02	1·81	0·30	24·17
2·91	2·61	3·94	5·11	1·67	0·36	24·37
5·47	3·64	4·22	5·12	1·44	0·32	28·50
4·76	3·09	4·09	3·94	1·38	0·50	26·33
2·85	2·80	5·58	4·16	1·21	0·29	23·93
2·26	2·42	6·14	3·07	1·14	0·23	20·90
2·98	3·98	7·04	3·61	1·27	0·38	24·95
3·21	3·96	6·41	3·47	1·33	0·44	25·07
2·86	3·36	6·54	3·81	1·18	0·43	24·45
2·95	3·82	7·15	4·21	1·39	0·21	25·83
2·79	2·36	5·93	3·25	1·47	0·26	22·05
2 18	2·26	6·09	3·22	1·35	0·30	21·49
2·50	2·93	6·78	3·75	1·61	0·34	23·90
2·90	3·25	6·16	3·48	1·65	0·31	23·19
2·81	3·12	6·39	3·79	1·92	0·38	24·12

Statistical Atlas of the Bombay Presidency, III Edition, Government

Bombay Karnataka : Average monthly and annual
Stations situated in the Bombay Karnataka.

Station	Jan.	Feb.	March	April	May	June
DHARWAR Dist.						
1. Dharwar.	0·07	0·03	0·29	1·74	3·09	4·58
2. Hubli.	0·09	0·02	0·25	1·68	2·76	3·84
3. Kalghatgi.	0·09	0·02	0·23	1·77	2·71	5·74
4. Shiggaon.	0·17	0·03	0·21	1·27	2·24	3·96
5. Hangal.	0·08	0·05	0·16	1·27	2·67	6·18
6. Hirekerur.	0·05	0·10	0·12	1·48	2·15	4·05
7. Ranibennur.	0·11	0·05	0·20	1·32	2·74	2·93
8. Haveri.	0·16	0·04	0·14	1·62	2·87	4·27
9. Gadag.	0·07	0·05	0·25	1·40	2·51	2·65
10. Mundargi.	0·16	0·04	0·12	0·77	2·43	2·30
11. Navalgund.	0·04	0·03	0·17	1·36	2·60	2·74
12. Nargund.	0·10	0·12	0·18	1·44	2·38	2·23
13. Ron.	0·04	0·08	0·15	0 90	2·17	3·44
N. KANARA Dist.						
1. Karwar.	0·05	0·04	0·00	0·52	3·23	37·03
2. Ankola.	0·05	0·08	0·00	0·44	3·22	38·71
3. Kumta.	0·09	0·06	0·03	0·48	3·73	40·93
4. Honavar.	0·06	0·06	0 02	0·58	3·56	40·04
5. Bhatkal.	0·22	0·03	0·07	0·80	4·56	41·63
6. Haliyal.	0·08	0·04	0·37	2·01	2·79	7·72
7. Supa.	0·06	0·04	0·26	1·78	2·19	17·38
8. Yellapur.	0·07	0·04	0·23	1·31	2·47	20·36
9. Mundgod.	0·10	0·04	0·34	1·58	2·63	7·74
10. Sirsi.	0·08	0·05	0·25	1·10	2·61	21·72
11. Siddapur.	0·07	0·08	0·12	1·07	2·69	23·72

* Vide foot-note on pp. 172-173.

rainfalls, in inches, as recorded in the Meteorological

July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Total
5·52	4·57	4·41	5·28	1·82	0·48	32·88
4·32	3·31	3·94	4·97	1·55	0·33	27·06
8·01	5·48	3·75	4·99	1·59	0·26	34·64
5·44	3·54	3·05	4·05	1·41	0·41	25·78
10·13	5·50	2·88	4·52	1·85	0·34	35·63
6·82	3·78	3·19	4·65	1·92	0·60	28·91
3·57	2·83	3·58	4·52	1·93	0·51	24·29
5·46	3·92	3·80	4·76	1·80	0·53	29·37
2·78	3·39	5·85	4·27	1·51	0·41	25·14
1·87	2·12	4·17	3·89	1·72	0·25	19·84
2·59	3·03	5·86	4·94	1·40	0 40	25·16
2·35	2·72	5·17	4·72	1·27	0·28	22·96
2·53	3·74	6·01	4 16	1·45	0·40	25·07
38·06	21·38	12 03	5·63	1·92	0·23	120·12
42·93	23·41	11·75	6 45	1·99	0·14	129·17
43·83	26·97	13·81	8·22	2·18	0·38	140·71
43·60	26·14	13·95	7·54	1·98	0·32	137·85
47·57	29·75	13·96	7·33	2·38	0·31	148·61
13·56	8·32	4·18	5·13	1·48	0·36	46·04
36·34	19·27	6·42	4·91	1·92	0·27	90·84
36·47	20·81	7·17	5·16	1·61	0·30	96·00
12·49	7·85	4·67	4·99	1·65	0·38	44·46
36·65	19·70	7·41	5·60	1·84	0·28	97·29
42·47	23·22	8·06	6·16	2·18	0·39	130·50

Bombay Karnataka: Total Area (Acreage) and area
1937–

Taluka	Total area	Cultivated	
		Net cropped area	Fallow area
BELGAUM Dist.			
1. Belgaum.	400,821	154,697	89,840
2. Hukeri.	219,533	153,685	21,498
3. Athni.	495,027	409 582	51,754
4. Chikodi.	317,293	239,982	42,014
5. Gokak.	429,827	304,267	31,391
6. Sampagaon.	262,343	212,653	9,806
7. Parasgad.	407,825	302,210	36,034
8. Khanapur.	405,082	103,668	51.559
Total Belgaum Dist.	2,937,751	1,880,744	333,896
BIJAPUR Dist.			
1. Bijapur.	579,886	434,698	94,347
2. Indi.	536,332	440,815	63,728
3. Sindgi.	518,251	453,292	39,589
4. Bagewadi.	488,955	414,479	44,016
5. Mudebihal.	364,400	319,075	20,949
6. Hungund.	333,306	275,530	13,542
7. Badami.	394,594	241,072	40,762
8. Bagalkot.	437,804	328,087	20,730
Total Bijapur Dist.	3,653,528	2,907,048	337,663

Information kindly supplied by the respective Inspectors of

cultivated and uncultivated in each Taluka during –1938

Area	Waste land available for cultiva-tion	Uncultivated Area		
		Not available for cultin.		
Total		Forest	Others	Total
244,537	14,527	93,116	48,641	156,284
175,183	3,294	21,018	20,038	44,350
461,336	3,519	969	29,203	33,691
281,996	7,334	6	27,957	35,297
335,658	4,331	55,533	34,305	94,169
222,459	3,892	19,508	16,484	39,884
338,244	8,887	32,284	28,410	69,581
154,227	7,291	227,567	14,997	249,855
2,214,640	53,075	450,001	220,035	723,111
529,045	13,924	1,569	35,348	50,841
504,543	3,711	—	28,078	31,789
492,881	2,691	—	22,679	25,370
458,495	2,742	2,871	24,847	30,460
340,024	2,246	—	22,130	24,376
289,072	1,395	24,330	18,509	44,234
281,834	6,394	87,063	19,303	112,760
348,817	5,123	58,161	25,703	88,987
3,244,711	38,226	173,994	196,597	408,817

Bombay Karnataka: Total Area (Acreage) and area 1937–

Taluka	Total area	Cultivated	
		Net cropped area	Fallow area
DHARWAR Dist.			
1. Dharwar.	276,731	189,544	17,374
2. Kalghatgi.	169,894	77,024	25,194
3. Bankapur.	219,739	150,860	24,188
4. Hangal.	191,656	122,987	17,010
5. Karajgi.	282,515	218,639	17,300
6. Ranibennur.	259,403	182,722	14,545
7. Kod.	256,111	178,824	16,957
8. Hubli.	205,158	178,081	6,658
9. Gadag.	447,914	356,034	28,150
10. Navalgund.	362,705	338,015	9,471
11. Ron.	278,082	256,355	6,520
Total Dharwar Dist.	2,949,908	2,249,085	183,367
N. KANARA Dist.			
1. Karwar.	180,805	24,440	7,666
2. Ankola.	227,001	19,312	6,473
3. Kumta.	144,134	28,386	7,686
4. Honavar.	186,516	22,290	9,753
5. Bhatkal.	86,165	16,171	3,143
6. Siddapur.	212,323	26,766	6,879
7. Sirsi.	327,167	32,058	18,035
8. Yellapur.	321,224	10,187	8,087
9. Mundgod(Peta)	165,082	9,859	10,090
10. Haliyal.	273,883	28,876	19,936
11. Supa (Peta).	402,759	8,361	7,122
Total N. Kanara Dist.	2,527,059	226,706	104,870

Vide foot-note on pp. 176–177.

The totals in these three columns for the N. Kanara district contain land, 17 acres in Forest land and 3 acres in "Others" land. As should be subtracted from their respective totals so that the total

cultivated and uncultivated in each Taluka during -1938

Area	Waste land available for cultivation	Uncultivated Area		
		Not available for cultin.		
Total		Forest	Others	Total
206,918	8,146	34,457	27,210	69,813
102,218	5,355	48,062	14,259	67,676
175,048	2,027	22,197	20,467	44,691
139,997	4,402	19,875	27,382	51,659
235,939	4,842	14,116	27,618	46,576
197,267	3,425	31,529	27,182	62,136
195,781	6,853	23,470	30,007	60,330
184,739	331	4,626	15,462	20,419
384,184	1,926	37,114	24,690	63,730
347,486	454	—	14,765	15,219
262,875	90	699	14,418	15,207
2,432,452	37,851	236,145	243,460	517,456
	†	†	†	
32,106	2,003	137,390	9,354	148,699
25,785	5,343	187,720	8,323	201,216
36,072	2,482	98,600	6,995	108,062
32,043	2,661	142,698	9,207	154,473
19,314	1,287	63,168	2,420	66,851
33,645	4,760	169,502	4,534	178,678
50,093	11,266	257,000	8,817	277,074
18,274	3,945	294,692	4,323	302,950
19,949	12,473	127,785	4,886	145,133
48,812	4,141	212,002	9,054	225,071
15,483	8,735	373,373	5,635	387,276
331,576	59,096	2,063,930	73,548	2,195,483

unassessed cultivated area in the following order—1071 acres in Waste these figures have already been included in the cultivated land they uncultivated area becomes 2,195,483 acres.

Bombay Karnátaka: Taluka Agricultural Returns

Taluka	Cereals			
	Rice	Wheat	Jowari	Bajri
BELGAUM Dist.				
1. Belgaum.	45,058	1,931	15,150	512
2. Hukeri.	3,226	729	42,874	12,146
3. Athni.	248	25,478	218,909	35,981
4. Chikodi.	2,741	2,556	66,480	18,279
5. Gokak.	76	27,450	124,581	52,855
6. Sampagaon.	19,915	12,316	62,571	3,413
7. Parasgad.	26	69,869	84,761	24,726
8. Khanapur.	48,946	35	2,750	378
Total Bel. Dist.	120,236	140,364	618,076	148,290
BIJAPUR Dist.				
1. Bijapur.	1,787	31,237	229,011	50,825
2. Indi.	2,067	16,285	268,412	60,957
3. Sindgi.	816	32,363	271,493	60,411
4. Bagewadi.	84	50,019	213,196	19,114
5. Mudebihal.	127	29,591	146,139	58,965
6. Hungund.	131	25,774	112,841	8,233
7. Badami.	215	14,820	83,922	39,652
8. Bagalkot.	35	26,282	154,360	16,427
Total Bij. Dist.	5,262	226,371	1,479,374	314,584

Vide foot-note on pp. 176–177

(acreages) for the year 1937–38.

			Pulses	
Ragi	Others	Total	Gram	Tur
18,721	16,596	97,968	596	1,603
2,893	9,285	71,153	1,993	7,101
21	3,786	284,423	13,801	6,507
1,145	10,214	101,415	4,520	9,979
101	10,238	215,301	5,828	5,987
805	16,898	115,918	3,838	6,140
18	9,347	188,747	8,153	5,773
10,345	4,723	67,177	484	221
34,049	81,087	1,142,102	39,213	43,311
18	Included in the acreages of the "Others" column of the Pulses.	314,011	3,655	Included in "Others."
40		349,698	4,543	
2		365,952	4,306	
2		283,480	4,749	
—		234,986	3,739	
—		146,986	4,753	
74		138,687	4,242	
—		197,334	3,884	
136		2,031,134	33,871	

Bombay Karnataka: Taluka Agricultural Returns

Taluka	Cereals			
	Rice	Wheat	Jowari	Bajri
DHARWAR Dist.				
1. Dharwar.	22,320	23,681	43,668	182
2. Kalghatgi.	32,172	40	11,745	29
3. Bankapur.	15,208	6,002	44,588	129
4. Hangal.	43,136	106	13,856	—
5. Karajgi.	2,241	833	71,561	160
6. Ranibennur.	435	403	66,124	198
7. Kod.	18,169	9	33,778	37
8. Hubli.	3,466	29,256	50,540	101
9. Gadag.	146	55,482	83,468	3,318
10. Navalgund.	—	132,377	64,523	174
11. Ron.	568	35,665	62,518	1,612
Total Dhar. Dist.	137,861	283,854	546,369	5,940
N. KANARA Dist.				
1. Karwar.	22,038	—	—	—
2. Ankola.	14,193	—	—	—
3. Kumta.	19,280	—	—	—
4. Honavar.	13,799	—	—	—
5. Bhatkal (Peta)	10,179	—	—	—
6. Siddapur.	12,416	—	—	—
7. Sirsi.	16,434	—	—	—
8. Yellapur.	6,974	—	8	—
9. Mundgod Peta	8,511	—	—	—
10. Haliyal.	25,231	1	457	—
11. Supa (Peta)	7,790	—	—	—
Total N. Kan. Dist.	156,845	1	465	—

Vide foot-note on pp. 176–177

(acreages) for the year 1937–38

			Pulses	
Ragi	Others	Total	Gram	Tur
980	4,936	95,767	4,274	4,588
2,212	2,879	49,077	318	1,142
4,854	11,473	82,254	923	5,376
7,086	5,389	69,573	1,049	1,909
1,047	16,371	92,213	550	5,418
1,065	15,110	83,335	556	4,936
16,018	17,258	85,269	445	2,792
709	3,387	87,459	3,940	3,647
406	7,612	150,432	5,090	5,247
—	191	197,265	15,062	1,052
115	3,317	103,795	6,770	3,841
34,492	87,923	1,096,439	38,977	39,948
11	—	22,049	—	—
66	—	14,259	—	—
81	—	19,361	—	—
165	—	13,964	—	22
36	—	10,215	—	—
35	—	12,451	—	—
183	3	16,620	—	14
4	—	6,986	—	—
334	13	8,858	40	2
682	91	26,468	267	52
125	6	7,921	—	—
1,728	113	159,152	307	90

Bombay Karnataka: Taluka Agricultural Returns

Taluka	Pulses (cont.)		
	Kulthi	Others†	Total
BELGAUM Dist.			
1. Belgaum.	6,283	11,611	20,093
2. Hukeri.	4,935	5,534	19,563
3. Athni.	4,738	10,030	35,076
4. Chikodi.	6,462	9,031	29,992
5. Gokak.	8,535	8,727	29,077
6. Sampagaon.	9,612	7,696	27,286
7. Parasgad.	10,433	4,737	29,106
8. Khanapur.	6,157	1,885	8,747
Total Belgaum Dist.	57,165	59,251	198,940
BIJAPUR Dist.			
1. Bijapur.	Included in "Others"	10,087	12,609
2. Indi.		12,298	14,904
3. Sindgi.		17,626	21,065
4. Bagewadi.		11,726	15,410
5. Mudebihal.		17,369	20,944
6. Hungund.		16,187	20,933
7. Badami.		26,713	30,951
8. Bagalkot.		18,296	21,950
Total Bijapur Dist.		130,302	158,766

* Vide foot-note on pp. 176–177.

† These acreages include the acreages of Mug, Udid, Matki, Wal, acreages include acreages in the "Others" column of the Cereals in

(acreages) for the year 1937—38

Oil-seeds				
Linseed	Sesame	Groundnut	Cocoanut	Safflower
17	378	1,007	—	215
5	76	24,674	—	1,029
191	226	20,010	—	9,634
75	269	21,009	4	4,868
1,178	720	6,905	—	8,691
118	229	7,561	—	2,323
2,137	240	15,000	—	11,548
—	56	27	2	3
3,721	2,194	96,193	6	38,311
3,355	1 873	3,686	—	15,402
4,182	2,725	13,064	—	17,917
7,747	1,230	9,621	—	21,503
8,261	248	2,207	—	13,072
2,608	1,459	2,072	—	9,125
3,916	517	12,827	6	5,271
2,102	566	39,770	3	3,427
4,658	520	6,130	—	5,828
36,829	9,138	89,377	9	91,545

Chavali, Peas, Lentils, etc. In case of the Bijapur district these addition.

Bombay Karnataka: Taluka Agricultural Returns

Taluka	Pulses (cont.)		
	Kulthi	Others §	Total
DHARWAR Dist.			
1. Dharwar.	7,797	6,480	23,139
2. Kalghatgi.	3,836	2,326	7,622
3. Bankapur.	11,675	8,573	26,547
4. Hangal.	7,610	3,715	14,283
5. Karajgi.	18,060	9,354	33,382
6. Ranibennur.	15,091	2,944	23,527
7. Kod.	12,865	2,249	18,351
8. Hubli.	7,281	5,138	20,006
9. Gadag.	9,633	9,433	29,403
10. Navalgund.	5,678	1,137	22,929
11. Ron.	4,509	5,265	20,385
Total Dharwar Dist.	104,035	56,614	239,574
N. KANARA Dist.			
1. Karwar.	—	302	302
2. Ankola.	6	267	273
3. Kumta.	12	789	801
4. Honavar.	51	477	550
5. Bhatkal.	190	895	1,085
6. Siddapur.	29	71	100
7. Sirsi.	214	42	270
8. Yellapur.	4	46	50
9. Mundgod (Peta)	654	212	908
10. Haliyal.	1,173	1,100	2,592
11. Supa (Peta)	9	2	11
Total N. Kanara Dist.	2,342	4,203	6,942

* Vide foot-note on pp. 176-177.

§ Vide foot-note † on p. 184.

(acreages) for the year 1937–38.

Oil-seeds				
Linseed	Sesame	Groundnut	Cocoanut	Safflower
401	242	2,477	—	3,664
47	76	15	4	1
528	1,245	1,403	2	662
237	197	419	117	22
149	1,947	6,744	114	252
15	448	13,037	74	150
4	147	1,416	127	11
947	348	1,019	—	5,980
1,840	2,220	32,193	8	12,698
2,888	19	162	—	20,292
3,435	390	22,550	—	6,440
10,491	7,279	81,435	446	50,172
—	—	1	1,645	—
—	1	27	1,449	—
—	5	1	2,460	—
—	46	158	3,676	—
—	8	1	1,485	—
—	2	1	13	—
—	1	1	87	—
—	—	—	709	—
4	3	—	3	1
3	6	3	19	—
—	—	—	100	—
7	72	193	11,646	1

Bombay Karnataka: Taluka Agricultural Returns

Taluka	Oil-seeds (cont.)		Condiments	
	Others §	Total	Chillies	Pepper
BELGAUM Dist.				
1. Belgaum.	1,746	3,363	1,468	—
2. Hukeri.	319	26,103	7,169	—
3. Athni.	110	30,171	1,269	—
4. Chikodi.	137	26,362	5,428	—
5. Gokak.	246	17,740	2,793	—
6. Sampagaon.	437	10,668	1,774	—
7. Parasgad.	424	29,349	232	—
8. Khanapur.	312	400	173	—
Total Bel. Dist.	3,731	144,156	20,306	—
BIJAPUR Dist.				
1. Bijapur.		24,503	700	—
2. Indi.	187	38,071	780	—
3. Sindgi.	183	40,285	918	—
4. Bagewadi.	184	23,998	710	—
5. Mudebihal.	210	16,954	179	—
6. Hungund.	1,690	23,045	206	—
7. Badami.	508	46,411	197	—
8. Bagalkot.	543	17,565	161	—
Total Bij. Dist.	429	230,832	3,851	—
	3,934			

* Vide foot-note on pp. 176-177.

§ These acreages include those of Ginger, Fenugreek, Turmeric, Fennel,

(acreages) for the year 1937–38.

and Spices		Sugars	Fibres		
Others §	Total	Sugarcane	Cotton	Others §§	Total
251	1,719	2,264	3,405	435	3,840
630	7,799	3,337	6,021	2,080	8,101
321	1,590	792	43,271	546	43,817
308	5,736	4,216	10,493	1,909	12,402
325	3,118	841[1]	32,622	1,962	34,584
1,609	3,383	748	29,099	1,012	30,111
182	414	167	53,085	694	53,779
8	181	750	209	194	403
3,634	23,940	13,115[1]	178,205	8,832	187,037
92	792	68	76,952	613	77,565
85	865	81	35,093	769	35,862
99	1,017	49	24,238	1,142	25,380
354	1,064	70	88,193	478	88,671
22	201	13	45,616	394	46,010
1	207	36	88,989	252	89,241
56	253	201	24,048	557	24,605
65	226	26	89,570	599	90,169
774	4,625	504	472,699	4,804	477,503

Coriander, Cumin, Onion, Garlic, Cardamum, etc.

1 Include 109 acres of other Sugars.

§§ These acreages include those of Sann Hemp, Ambadi, etc.

Bombay Karnataka: Taluka Agricultural Returns

Taluka	Oil-seeds (cont.)		Condiments	
	Others	Total	Chillies	Pepper
DHARWAR Dist.				
1. Dharwar.	390	7,174	1,062	—
2. Kalghatgi.	166	309	286	—
3. Bankapur.	1,396	5,236	815	—
4. Hangal.	922	1,914	2,947	—
5. Karajgi.	1,310	10,516	6,437	—
6. Ranibennur.	603	14,327	11,315	—
7. Kod.	1,353	3,058	39,626	—
8. Hubli.	1,477	9,771	1,219	—
9. Gadag.	1,407	50,366	615	—
10. Navalgund.	343	23,704	86	—
11. Ron.	496	33,311	411	—
Total Dhar. Dist.	9,863	159,686	64,819	—
N. KANARA Dist.				
1. Karwar.	46	1,692	4	—
2. Ankola.	33	1,509	4	2
3. Kumta.	71	2,532	21	43
4. Honavar.	95	3,929	20	12
5. Bhatkal (Peta)	45	1,531	—	14
6. Siddapur.	2	16	31	1,283
7. Sirsi.	43	131	61	1,337
8. Yellapur.	—	709	7	133
9. Mundgod Peta	45	53	16	1
10. Haliyal.	15	40	56	—
11. Supa (Peta)	—	100	14	2
Total N. Kan. Dist.	395	12,242	234	2,827

* Vide foot-note on pp. 176–177.

§ Vide foot-note § on pp. 188-189.

(acreages) for the year 1937–38.

and Spices		Sugars	Fibres		
Others§	Total	S. cane	Cotton	Others§§	Total
28	1,090	183	34,107	1,116	35,223
5	291	149	7,302	284	7,586
39	854	132	25,910	676	26,586
53	3,000	514	11,298	466	11,764
42	6,479	95	67,571	468	68,039
523	11,838	30	45,828	209	46,037
300	39,926	508	18,252	346	18,598
53	1,272	1	49,362	717	50,079
127	742	132	121,561	1,033	122,594
23	109	10	93,340	210	93,550
10	421	21	99,073	114	99,187
1,203	66,022	1,775	573,604	5,639	579,243
14	18	223	—	11	11
16	22	236	—	18	18
375	439	317	—	11	11
9	41	516	—	18	18
44	58	253	—	57	57
373	1,687	475	—	—	—
221	1,619	399	—	2	2
69	209	193	—	—	—
2	19	117	—	4	4
19	75	87	—	46	46
5	21	44	—	—	—
1,147	4,208	2,860	—	167	167

Vide foot-note §§ on p. 189.

Bombay Karnatcka: Taluka Agricultural Returns

Taluka	Drugs and Narcotics			
	Tobacco	Betel Leaves	Betelnut	Total
BELGAUM Dist.				
1. Belgaum.	45	—	14	65[1]
2. Hukeri.	11,822	25	—	11,847
3. Athni.	1,642	398	—	2,040
4. Chikodi.	41,455	407	—	41,862
5. Gokak.	2,551	18	—	2,569
6. Sampagaon.	142	—	—	142
7. Parasgad.	48	1	—	49
8. Khanapur.	—	—	—	—
Total Belgaum Dist.	57,705	849	14	58,574[1]
BIJAPUR Dist.				
1. Bijapur.	59	Only total figure given	—	Only totol figure given
2. Indi.	237		—	
3. Sindgi.	213		—	
4. Bagewadi.	71		—	
5. Mudebihal.	57		—	
6. Hungund.	481		—	
7. Badami.	2		—	
8. Bagalkot.	3		—	
Total Bijapur Dist.	1,123	154	—	1,277

§ Vide foot-note on pp. 176-177.

1 Include 6 acres of Tea.

(acreages) for the year 1937—38.

Grass & Fodder crops	Fruits & Vege-tables	Mis. Food &Non-food crops	Gross sown area	Twice sown area	Net cropped area
35,309	2,631	6	167,258	12,561	154,697
7,865	1,016	28	156,812	3,127	153,685
10,584	1,835	9	410,337	755	409,582
19,392	1,527	24	242,928	2,946	239,982
1,545	1,324	—	306,099	1,832	304,267
29,240	749	—	218,245	5,592	212,653
295	870	—	302,776	566	302,210
27,895	474	—	106,027	2,359	103,668
132,125	10,426	67	1,910,482	29,738	1,880,744
4,424	1,376	9	435,437	739	434,698
2,311	956	—	442,985	2,170	440,815
422	627	—	455,010	1,718	453,292
1,052	737	—	415,619	1,140	414,479
261	261	—	319,687	612	319,075
11	440	—	281,407	5,877	275,530
42	685	—	241.865	793	241,072
373	643	—	328,301	214	328,087
8,896	6,725	9	2,920,311	13,263	2,907,048

Bombay Karnataka: Taluka Agricultural Returns

Taluka	Drugs and Narcotics			
	Tobacco	Betel Leaves	Betelnut	Total
DHARWAR Dist.				
1. Dharwar.	9	1	—	10
2. Kalghatgi.	—	—	2	2
3. Bankapur.	99	179	4	282
4. Hangal.	9	214	222	445
5. Karajgi.	72	286	23	381
6. Ranibennur.	333	325	1	659
7. Kod.	10	216	50	276
8. Hubli.	3	5	—	8
9. Gadag.	78	113	—	191
10. Navalgund.	1	—	—	1
11. Ron.	8	44	—	52
Total Dhar. Dist.	622	1,383	302	2,307
N. KANARA Dist.				
1. Karwar.	—	1	29	30
2. Ankola.	—	1	465	466
3. Kumta.	—	11	639	650
4. Honavar.	—	311	1,424	1,735
5. Bhatkal (Peta)	—	37	394	431
6. Siddapur.	—	60	5,914	5,975[1]
7. Sirsi.	—	39	5,409	5,449[1]
8. Yellapur.	—	10	2,068	2,078
9. Mundgod Peta	—	1	18	19
10. Haliyal.	—	—	1	1
11. Supa (Peta)	—	3	154	159[2]
Total N. Kan. Dist.	—	474	16,515	16,993[3]

* Vide foot-note on pp. 176-177.

1. Include 1 acre of Coffee. 2. Include 2 acres of Coffee.
3 Include 4 acres of Coffee.

(acreages) for the year 1937–38.

Grass & Fodder crops	Fruits & Vege-tables	Misc. Food and Non-food crops	Gross sown area	Twice sown area	Net cropped area
27,569	2,626	6	192,787	3,243	189,544
13,646	180	—	78,863	1,839	77,024
10,950	440	—	153,281	2,421	150,860
25,056	705	—	127,254	4,267	122,987
7,753	1,061	16	219,935	1,296	218,639
4,339	1,346	1	185,439	2,717	182,722
15,463	406	—	181,855	3,031	178,824
8,737	1,294	5	178,632	551	178,081
703	1,943	—	356,506	472	356,034
6	442	—	338,016	1	338,015
21	569	—	257,762	1,407	256,355
114,243	11,012	28	2,270,330	21,245	2,249,085
144	1,085	44	25,298	1,158	24,440
2,099	1,009	16	19,909[1]	597	19,312[1]
4,637	907	538	30,193	1,807	28,386
1,157	1,034	2,048	24,992	2,702	22,290
2,512	387	1,769	18,298	2,127	16,171
7,772	1,067	2	29,545	2,779	26,766
9,043	1,500	4	35,037	2,979	32,058
343	540	—	11,108	921	10,187
60	82	—	10,120	261	9,859
814	181	1	30,305	1,429	28,876
128	163	1	8,548	187	8,361
28,709	7,955	4,423	243,653[1]	16,947	226,706[1]

1. Contain 2 acres of Dyes which are not given in the detailed statement.

Bombay Karnataka: Acreages under Crops irrigated by

Sour.	District	Rice	Wheat	Barley	Jowari	Bajri	Maize
Government Canals	Belgaum.	29	—	198	3	—	2,322
	Bijapur.	—	—	—	—	—	—
	Dharwar.	8,294	—	—	—	—	—
	N. Kanara.	484	—	—	—	—	—
	Total.	8,807	—	198	3	—	2,322
Private Canals	Belgaum.	654	63	—	4	—	143
	Bijapur.	12	—	18	64	—	—
	Dharwar.	—	—	—	—	—	—
	N. Kanara.	3,089	—	—	—	—	—
	Total.	3,755	63	18	68	—	143
Wells	Belgaum.	417	774	1,603	3,799	—	5,618
	Bijapur.	412	433	3,113	9,637	27	1,524
	Dharwar.	66	—	—	—	—	1
	N. Kanara.	58	—	—	—	—	—
	Total.	953	1,207	4,716	13,436	27	7,143
Tanks	Belgaum.	10,258	—	—	—	—	—
	Bijapur.	255	—	12	34	—	—
	Dharwar.	49,960	106	—	—	—	—
	N. Kanara.	17,415	—	—	—	—	—
	Total.	77,888	106	12	34	—	—
Other Sources	Belgaum.	944	52	1	7	—	135
	Bijapur.	—	—	—	—	—	—
	Dharwar.	18,178	—	—	—	—	—
	N. Kanara.	4,838	—	—	—	—	—
	Total.	23,960	52	1	7	—	135
Total All Sources	Belgaum.	12,302	889	1,802	3,813	—	8,218
	Bijapur.	679	433	3,143	9,735	27	1,524
	Dharwar.	76,498	106	—	—	—	1
	N. Kanara.	25,884	—	—	—	—	—
	Total.	115,363	1,428	4,945	13,548	27	9,743

Seasons Crop Report of the Bombay Province for the year 1937–38. Government Central Press, Bombay, 1939. pp. 74–81.

different Sources of irrigation in each district: 1937-38.

Other Cereals, Pulses	Sugar cane	Other Food Crops	Cotton	Other non-Food Crops	Gross irrigated area	Area irrigated more than once	Net irrigated area
3,261	242	1,060	1,178	1,530	9,823	947	8,876
—	—	177	—	47	224	10	214
284	244	—	—	64	8,886	—	8,886
—	6	—	—	—	490	—	490
3,545	492	1,237	1,178	1,641	19,423	957	18,466
2126	517	148	24	259	1,938	125	1,813
2	—	8	—	2	106	—	106
—	—	—	—	—	—	—	—
102	265	13	—	5	3,474	—	3,474
230	782	169	24	266	5,518	125	5,393
4,847	9,547	5,090	2,441	8,835	42,971	3,644	39,327
308	542	14,146	2,940	8,224	41,306	4,762	36,544
—	450	514	—	324	1,355	225	1,130
3	740	361	—	27	1,189	—	1,189
5,158	11,279	20,111	5,381	17,410	86,821	8,631	78,190
—	633	4	—	—	10,895	29	10,866
—	—	265	—	271	837	6	831
553	837	245	—	255	51,956	239	51,717
50	480	14	—	4	17,963	2	17,961
603	1,950	528	—	530	81,651	276	81,375
194	1,364	340	8	182	3,227	148	3,079
—	—	—	—	—	—	—	—
—	38	—	—	—	18,216	—	18,216
81	710	135	—	11	5,775	—	5,775
275	2,112	475	8	193	27,218	148	27,070
8,428	12,303	6,642	3,651	10,806	68,854	4,893	63,961‡
310	542	14,596	2,940	8,544	42,473	4,778	37,695‡
837	1,569	759	—	643	80,413	464	79,949‡
236	2,201	523	—	47	28,891	2	28,889‡
9,811	16,615	22,520	6,591	20,040	220,631	10,137	210,494

‡ These figures will work out to 2.9%, 1.2%, 3.3%, and 8.7% of the total cultivated area in the respective districts.

Bombay Karnataka: Information about Irrigation Works for which Capital and Revenue Accounts are kept.*

Name of work	Area of four months' crop which could be irrigated. †	Annual average area irrigated between 1933-34 and 1935-36	Information about the supply, whether dependent on local rain or reliable	Remarks
	Acres	Acres		
1 Gadikeri Tank	416	418	Local rain	Plateau Catchment
2 Gokak Canal	17,627	7,098	Reliable	Ghat Catchment
3 Muchkundi Tank	750		Local rain	Plateau Catchment
4 Dambal Tank	531	260	- do -	- do -
5 Medleri Tank	231	45	- do -	- do -
6 Madag Tank	1,418	523	- do -	Ghat & Forest Catchment
7 Asundi Tank	503	343	- do -	Plateau Catchment
8 Dharma Canal	6.580‡	5,700	- do -	Forest Catchment
9 Mavinkop Tank	617	575	- do -	- do -

* Irrigation Administrative Report, Bombay Province, Pt. 1, for the year 1936-37. Bombay, 1938. pp. 5 and 38-41.

† Area of four months' crops which could be irrigated in normal years with a duty at the head of the Canal of 120 acres for the monsoon and 120 acres for the *rabi* season per Cusec.

‡ For monsoon only. Nil for *rabi* season.

Bombay Karnataka: Taluka Population Statistics for the year 1931

Taluka	Population	Taluka	Population
BELGAUM Dist.		BIJAPUR Dist.	
1. Belgaum.	123,628	1. Bijapur.	138,345
2. Chandgad (P.)	35,329	2. Indi.	101,104
3. Khanapur.	74,698	3. Sindgi.	97,816
4. Sampagaon.	124,105	4. Bagewadi.	104,170
5. Parasgad.	108,768	5. Mudebihal.	81,523
6. Gokak.	145,083	6. Bagalkot.	79,050
7. Chikodi.	197,866	7. Badami.	113,528
8. Hukeri.	124,175	8. Hungund.	111,816
9. Athni.	143,049	9. Bilgi (Peta).	41,861
Total	1,076,701	Total	869,220
DHARWAR Dist.		N.KANARA Dist.	
1. Dharwar.	121,311	1. Karwar.	64,264
2. Hubli.	151,859	2. Ankola.	38,150
3. Kalghatgi.	42,289	3. Kumta.	65,832
4. Bankapur.	81,377	4. Honavar.	64,105
5. Hangal.	71,232	5. Bhatkal (Peta)	40,760
6. Kod.	93,270	6. Haliyal.	29,225
7. Ranibennur.	108,838	7. Supa (Peta)	14,336
8. Karajgi.	103,237	8. Yellapur.	15,658
9. Gadag.	112,428	9. Mundgod(Peta)	12,171
10. Navalgund.	60,873	10. Sirsi.	39,955
11. Ron.	98,048	11. Siddapur.	33,379
12. Nargund (P.)	26,263		
13. Mundargi (P.)	31,652		
Total	1,102,677	Total	417,835

APPENDIX H. Glossary

(E: English K: Kannada M: Marathi)

Acacia: Acacia arabica; K. Jali; M. Babul.

Agave: Agave americana (or cantula); E. American Aloe; K. Kalnar; M. Ghayal.

Alasandi: Vigna catiang; E. Cow pea; M. Chavali;

Ambadi: Hibiscus canabinus; E. Deccan hemp; K. Pundi.

Artificial Vegetation: Cultivated Vegetation: agricultural and horticultural crops.

Avare: Dolichos lablab; E. Indian bean; M. Val.

Babul: Acacia arabica; E. Acacia; K. Jali.

Bajri: Pennisetum typhoideum; E. Spiked millet; K. Sajje.

Barley: Hordeum vulgare; K. Javegodi; M. Jav, Satu.

Basalt: Small grained basic igneous rock.

Batagadle: Pisum arvense; E. Field pea; M. Vatana.

Betel leaf: Piper betel; K. Villedele; M. Pan (Vidyache).

Betelnut: Areca catechu; K. Adike; M. Supari.

Bhatta: Paddy, Rice in husk.

Bija Sal: Pterocarpus marsupium; K. Honni; M. Asana.

Bilematti: Terminalia paniculata; M. Kindal.

Bombay Hemp: Crotolaria juncea; E. Sann hemp; K. Sanabu; M. Sann.

Breccia: Rock made up of large angular pieces of stones.

Cardamum: Elettaria cardamomum; K. Yalakki; M. Velchi, Veldoda.

Cashewnut. Anacardium occidentale; K. Godambi; M. Kaju.

Channangi: Lens esculentus; E. Lentils; M. Masur.

Chavali: Vigna catiang; E. Cow pea; K. Alasandi.

Chillies: Capsicum frutescens; E. Cayenne pepper; K. Mensikai; M. Mirachi.

Conglomerate: Sandstone made up of large pieces of pebbles.

Coriander: Coriandrum sativum; K. Kotambri, Havija; M. Kothimbir, Dhane.

Crystallines: Crystalline rocks.

Cumin: Cumunum cyminum; K. Jeerige; M. Jire.

Deccan Hemp: Hibiscus canabinus; K. Pundi; M. Ambadi.

Desh: Open country: The easternmost part of the Bombay Karnataka.

Dhoti: A loin cloth for men.

Dokra: A large bag of seed-cotton; K. Hatti Andige.

Drift Soil: Transported soil: Soil brought down either by rivers or by winds.

Fennel: Foeniculum vulgare; K. Badisappu; M. Badisep.

Fenugreek: Trigonella foenum-groecum; K. Mente; M. Methi.

Gadinad: The transition tract of the Bombay Karnataka.

Ghee: Clarified butter; K. Tuppa; M. Ghee.

Ginger: Gingiber officinale; K. Khargenasu; M. Ale.

Gneisses: Metamorphic rocks having different coloured minerals arranged in contorted layers and showing flow structure.

Granites: Rocks containing usually minerals like feldspars, quartz, mica, hornblende, etc., and having more than 66% of silica (acidic rocks).

Grits: Gritty sandstone.

Guava: Psidum guyava; K. Perala hannu; M. Peru.

Gudar: A coarse cotton cloth for use as a carpet.

Hariyali: Cynodon dactylon; A pernicious perennial weed of rich soils; K. Kariki.

Hesaru: Phaseolus mungo; E. Green gram; M. Mug.

Hingari crop: Winter crop; M. Rabi crop.

Honni: Pterocarpus marsupium; E. Bija Sal; M. Asana.

Hurali: Dolichos biflorus; E. Horse gram; M. Kulthi.

Igneous Rocks: Rocks obtained by the consolidation of under-ground rock melt or magma: 'Fire' rocks.

Intrusive Rocks: Rocks formed by the slow cooling of under-ground rock melt (magma) coming near the, and not on to the, surface of the earth and later exposed due to denudation of the surface.

Jack Fruit: Artocarpus integrifolia; K. Halasu; M. Phanas.

Jaggery: Raw sugar; K. Bella; M. Gul.

Jale: Acacia arabica; E. Acacia; M. Babul.

Jamba: Xylia xylocarpa; K. Jamba; M. Jamba.

Jola or Jowar: Andropogon sorghum; E. Great millet; M. Jondhala.

Kagga Bhatta: Salt land rice.

Kambli: A coarse woollen blanket.

Karematti: Terminalia tamentosa; E. Laurel; M Matti.

Kariki: Cynodon dactylon; A pernicious perennial weed of rich soils; M. Hariyali.

Karkhandar: Factory owner.

Karla soil: Sticky soil containing large quantity of soluble salts.

Khana: A cloth for making of bodice.

Kharif crop: Summer crop; K. Mungari bele.

Kindal: Terminalia paniculata; K. Bile matti; M. Kinda.

Kodra: Paspalum scorbiculatum: K. Harik.

Kulthi: Dolichos biflorus; E. Horse gram; K. Hurali.

Kumri cultivation: Shifting cultivation.

Kuruba: A shepherd.

Lakh: One hundred thousand; K. Laksha.

Laurel: Terminalia tamentosa; K. Karematti; M. Matti.

Lava: Underground hot melted rock (magma) coming out through holes in the crust of the earth and consolidating after cooling.

Lentils: Lens esculentus; K. Channangi; M. Masur.

Madaki: Phaseolus aconitipholius; E. Kidney bean; M. Mat, Matki.

Malnad: Area having more rainfall.

Masur: Lens esculentus; E. Lentils; K. Channangi.

Metamorphic Rocks: Altered rocks.

Matki: Phaseolus aconitipholius; E. Kidney bean; K. Madaki.

Mug: Phaseolus mungo; E. Green gram; K. Hesaru.

Mungari crop: Summer crop; Crop growing at the time of S. W. rains; M. Kharif crop.

Mustard: Brassica juncea; K. Sasivi; M. Mohri, Rai.

Nachni, Nagli: Eleusine coracana; K. Ragi.

Nana: Nandi: Lagerstroemia parviflora; K. Nandi; M. Nana.

Navani: Seteria italica; M. Rala.

Niger seed: Guizotia abyssinica; K. Gurellu; M. Karale, Kurashni.

Peta: A head dress for males; A revenue division smaller than a taluka.

Pitambar: A silk long cloth, with elaborate designs, for ladies.

Porphyritic Rock: Rock containing large crystals in a medium of small crystals or glass.

Pundi: Hibiscus canabinus: E. Deccan hemp; M. Ambadi.

Quartzite: Altered sandstone.

Rabi crop: Winter crop; K. Hingari bele.

Ragi: Eleusine coracana; M. Nagli, Nachni.

Rala: Seteria italica (Panicum italicum); K. Navani.

Rape seed: Brassica compestris; M. Shiras.

Rose wood: Dalbergia latifolia; K. Beeti; M. Sisam.

Safflower: Carthamus tinctorius; K. Kusibi; M. Karadi, Kusumba.

Sann: Crotolaria juncea; E. Bombay hemp; K. Sanabu.

Sajje: Penisetum typhoideum; E. Spiked millet; M. Bajri.

Sari: A long cloth worn on the body by ladies.

Sava: Panicum miliare; K. Savi.

Savi: Panicum miliare; M. Sava.

Schists: Much altered clay rocks.

Sesame or Sesamum: Sesamum indicum; K. Yellu; M. Til.

Shale: Less altered clay rock; K. Katagu.

Siddi people: Tribal people having negro characteristics.

Synclinorium: Large basin-like folded rock structure having a number of small basin-like folds in it.

Takavi Loans: Government loans to poor cultivators given in kind and realised along with land assessment.

Taluka: A revenue division of a district

Tamarind: K. Hunashi; M. Chincha.

Teak: Tectona grandis; K. Sagavani; M. Saga.

Togari: Cajanus indicus; E. Pigeon pea; M. Tur.

Trap: Meaning 'steps'. A term applied to weathered lava flows of the Deccan which look like steps.

Tur: Cajanus indicus; E. Pigeon pea; K. Togari.

Turmeric: Curcuma longa; K. Arishina; M. Halad.

Uddu: Phaseolus radiatus; E. Black gram; M. Udid.

Udid: Phaseolus radiatus; E. Black gram; K. Uddu.

Val: Dolichos lablab; E. Indian bean; K. Avare.

Vatana: Pisum arvense; E. Field pea; K. Batagadle.

Yerinad: Tract covered by black soil (Eastern part of Bombay Karnataka).

INDEX.

N. B.— Numerals of '159-60' variety give the main page of reference.